COVANTA
Powering Today. Protecting Tomorrow.

Covanta Honolulu Resource Recovery Venture, LLC
91-174 Hanua Street
Kapolei, HI 96707
Tel: 808.682.2099
Fax: 808.682.5203

RETURN RECEIPT REQUESTED
7020 1290 0000 5655 9775

June 23, 2021

Lene Ichinotsubo, P.E.
Solid & Hazardous Waste Branch
Environmental Management Division
Hawaii Dept. of Health
2827 Waimano Home Road, Rm. #100
Pearl City, HI 96782

Re: CHRRV's Solid Waste Permit No. IN-0049-11
Subject: 2nd Quarter 2021 Ash Sampling Results for Units 1, 2, 3

Dear Ms. Ichinotsubo:

Please find the enclosed Ash Characterization Reports which includes the final analysis and disposition of ash samples collected in 2nd Quarter 2021. All samples were analyzed and evaluated in accordance with SW-846 methods and the EPA Office of Solid Waste, Guidance for the Sampling and Analysis of Municipal Waste Combustion Ash (June 1995), as required by the Solid Waste Permit.

Covanta HPOWER has been conducting sampling for Units 1 and 2 under the new fully operational ash tower conditions since 4th quarter 2020. The configuration of the new tower is consistent with what was submitted in the addendum to the ash tower modification on July 17, 2020.

Unit 3 Ash Sampling was collected utilizing a modified ash sampling plan discussed in correspondence dated August 12, 2016.

In summary, all results were below regulatory thresholds. If there are any questions, please contact Ms. Katelyn Asato at 682-0264.

Sincerely,

Tony Waldo
Facility Manager

KTA:tt
210603tw

Enclosure
cc: Ahmad Sadri, City & County of Honolulu
Lene Ichinotsubo, State of Hawaii, Department of Health (e-mail)

COVANTA HONOLULU RESOURCE RECOVERY VENTURE

Units 1 & 2

2nd Quarter 2021 Ash Characterization Results

COVANTA INC.
ENVIRONMENTAL DEPARTMENT

ENVIRONMENTAL TEST REPORT
FOR
HONOLULU RESOURCE RECOVERY VENTURE'S H-POWER UNIT 1, 2

CEG REPORT NO.:	4514
REPORT DATE:	June 16, 2021
PREPARED FOR:	Honolulu Resources Recovery Venture H-Power
PURPOSE:	Characterization of Ash Residue from Unit 1 and 2
SAMPLE PERIOD:	April 2021
ASSOCIATED REPORTS:	Sampling Protocol Dated July 31, 1990 And EPA'S Final Guidance
PREPARED BY:	Covanta, Inc. Environmental Department

COMBINED ASH RESIDUE CHARACTERIZATION REPORT
FOR
HONOLULU RESOURCE RECOVERY VENTURE'S H-POWER UNIT 1 and 2

TABLE OF CONTENTS

1.0 INTRODUCTION

A combined ash residue characterization program was implemented for the RDF combustion Units 1and 2 at the H-Power Municipal Combustor facility located in Kapolei, Hawaii. The program was designed to be consistent with the Hawaii Department of Health's Solid Waste Management requirements for the management of ash residue from municipal waste incineration regulations. Ash sampling for Units 1 and 2 at the H-Power Municipal Waste Combustor Facility were performed by representatives of the Honolulu Resource Recovery Venture (HRRV) during April 2021. The sampling program was conducted in accordance with the procedures provided in the Facility Combined Ash Sampling Protocol: June 2012 (the protocol), with the exception of the described sample being unloaded from a trailer. As discussed with the Agency throughout 2020, Covanta HPOWER transitioned to the new RDF ash tower in September 2020. In the new configuration, consistent with the July 17, 2020 submittal, the ash falls to a bunker and is then mixed and loaded to a trailer for transport to the landfill. All other multi-incremental sampling methodology is consistent with the 2012 sampling protocol. The program was designed to incorporate the analytical procedures in EPA's May 24,1994 draft guidance document, "Sampling and Analysis of Municipal Refuse Incinerator Ash" (1) and its supporting document, "Test Methods for Evaluating Solid Waste" (SW-846). (2) The analytical program is consistent with the EPA's final guidance on ash sampling. (3) The ash samples were evaluated in accordance with the procedures set forth by the U.S. EPA Toxicity Characteristic Leaching Procedure (TCLP), Method 1311, as described in 40 CFR 261, Appendix II.

2.0 FIELD ASH SAMPLING PROCEDURES

Field sampling of the combined ash was performed by representatives of the facility at a location consistent with the designated sampling site in the approved sampling protocol and where representative samples could be safely obtained. Ten ash samples were collected during April 2021. The sample dates and associated sample labels for the ten samples ultimately analyzed are identified in Table 1.

3.0 LABORATORY INFORMATION

One subsample was generated from the ten individual composite ash samples that were collected during the ash characterization. This one composite sample was delivered to the Pace Analytical Services, LLC. laboratory for dioxin and furan analysis. The ten individual composite samples collected for TCLP metals determination were delivered to Element One Inc. for sample preparation and TCLP analysis for the eight RCRA metals as determined by EPA Method 1311. Both Element One Inc. and Pace Analytical Services, LLC. are NELAP and a NELAC accredited laboratories in several US States.

4.0 ASH SUBSAMPLE PREPARATION

When received at analytical lab Element One Inc., the ten ash samples were weighed and screened through a 0.375" sieve to determine percent of material, plus and minus the sieve size and to do additional crushing as necessary. In addition to analyzing each sample for TCLP for the RCRA metals, an additional subsample from each of the ten ash samples was taken to determine the moisture content, percent volatile solids, laboratory pH, total RCRA metals and total hexavalent chromium.

Table 1 presents the laboratory preparation weights of the individual samples and the moisture results. The laboratory data used to develop Table 1 is provided in Appendix A.

5.0 ANALYTICAL PROCEDURES

The Toxicity Characteristic Leaching Procedure (TCLP) was performed in accordance with Method 1311 as detailed in the Environmental Protection Agency Manual SW-846 - Test Methods for Evaluating Solid Waste - Physical/Chemical Methods.

6.0 DATA ANALYSIS

6.1 ANALYTICAL RESULTS

The laboratory analytical results are presented as Appendices A and B of this report. The laboratory analytical data presented as Appendix A have been evaluated in accordance with the procedures in SW-846, Chapter 9. The quality assurance and quality control results are also submitted in Appendix A and Appendix B.

6.2 STATISTICAL RESULTS

The statistical results for metals are presented in Table 2. Laboratory results below the detection limit are presented in Table 2 as the laboratory detection limit.

Table 3 presents a comparison of the Regulatory Threshold for each metal analyte and the relevant SW-846 statistical value for determining whether a waste material exhibits a toxic characteristic.

6.3 DIOXIN AND FURAN ANALYSIS

The results of the single composite combined ash sample for dioxins and furans are attached as Appendix B. The total 2,3,7,8-TCDD Equivalence was 130 ng/Kg or ppt. The total tetrachlorinated dibenzo-dioxins (TCDD) and furans (TCDF) are expressed in units of parts per trillion (ppt). The wet results represent 21.4% moisture content as determined by the 10.0-gram sample analyzed by Pace Analytical Services, LLC. The pertinent information from this laboratory report is as follows:

Analyses Reference	Analyte	Dry Results (ppt)	Wet Results (ppt)
DB-5/ DB-225	Total TCDD	200	157
DB-5/ DB-225	Total TCDF	930	731

6.4 TOTAL METALS AND HEXAVALENT CHROMIUM

Total and TCLP metals (arsenic, barium, cadmium, chromium, lead, selenium and silver) were analyzed for each of the ten samples using the analytical procedure 6020B. Total mercury was analyzed using procedure 7470A and TCLP mercury was analyzed using procedure 7470A.The procedure used for hexavalent chromium was 3060A.

7.0 CONCLUSION

All analytical data was evaluated in complete compliance with the procedures set forth and required by SW-846. The composite analytical evaluation and the statistical evaluation have determined that the ash does not exhibit a hazardous characteristic and that it should be managed as a non-hazardous solid waste.

8.0 REFERENCES

(1) Environmental Protection Agency,
"Sampling and Analysis of Municipal Refuse Incinerator Ash," (Draft Guidance Document) May 1994

(2) Environmental Protection Agency,
"Manual SW-846 - Test Methods for Evaluating Solid Waste - Physical/Chemical Methods," March 1992.

(3) Environmental Protection Agency,
"Guidance for the Sampling and Analysis of Municipal Waste Combustion Ash for the Toxicity Characteristic," June 1995.

Table 1

FIELD ASH SAMPLE SCHEDULE AND BULK CHARACTERISTICS

		Composite Subsample Bulk Characteristics (Kilograms)			
Sample	Date	Greater than 3/8 Inches and Non-Crushable Metals	Less than 3/8 Inches	Total	Moisture (As Wt. %)
36688-1	4/19/2021	0.00	0.09	0.09	21.9
36688-2	4/19/2021	0.00	0.09	0.09	22.0
36388-3	4/20/2021	0.00	0.10	0.10	23.8
36388-4	4/21/2021	0.00	0.10	0.10	19.9
36388-5	4/21/2021	0.00	0.10	0.10	22.5
36388-6	4/21/2021	0.00	0.10	0.10	20.1
36388-7	4/23/2021	0.00	0.10	0.10	20.9
36388-8	4/23/2021	0.00	0.10	0.10	21.3
36388-9	4/28/2021	0.00	0.10	0.10	22.9
36388-10	4/28/2021	0.00	0.10	0.10	24.6

TABLE 2.0 LABORATORY RESULTS FOR THE COVANTA HONOLULU INC.-UNITS 1, 2 FACILITY

2.1 SAMPLE SPECIFIC RESULTS

Sample Number	Date of Composite	Concentration Levels (mg/l) Arsenic (As)	Barium (Ba)	Cadmium (Cd)	Chromium (Cr)	Lead (Pb)	Mercury (Hg)	Selenium (Se)	Silver (Ag)
36688-1	4/19/2021	0.05	0.510	0.050	0.073	0.05	0.0004	0.05	0.05
36688-2	4/19/2021	0.05	0.623	0.05	0.05	0.05	0.0004	0.05	0.05
36688-3	4/20/2021	0.05	0.440	0.05	0.05	0.05	0.0004	0.05	0.05
36688-4	4/21/2021	0.05	0.487	0.05	0.05	0.05	0.0004	0.05	0.05
36688-5	4/21/2021	0.05	0.396	0.05	0.069	0.05	0.0004	0.05	0.05
36688-6	4/21/2021	0.05	0.473	0.05	0.067	0.05	0.0004	0.05	0.05
36688-7	4/23/2021	0.05	0.493	0.05	0.05	0.05	0.0004	0.05	0.05
36688-8	4/23/2021	0.05	0.480	0.05	0.05	0.05	0.0004	0.05	0.05
36688-9	4/28/2021	0.05	0.484	0.05	0.05	0.05	0.0004	0.05	0.05
36688-10	4/29/2021	0.05	0.470	0.05	0.05	0.05	0.0004	0.05	0.05

2.2 Statistical Analysis

Regulatory Threshold	5.0	100.0	1.0	5.0	5.0	0.20	1.0	5.0
Number of Samples	10	10	10	10	10	10	10	10
Sum of the Concentrations	0.50	4.858	0.50	0.56	0.50	0.0040	0.50	0.50
(Sum of the Concentrations)^2	0.25	23.600	0.25	0.31	0.25	0.00002	0.25	0.25
Sum of the Squares of the Concentrations	0.03	2.390	0.03	0.03	0.03	0.000002	0.03	0.03
Student "T" Constant (two tailed confidence interval @ 80%, t.20)	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38
Mean, x	0.05	0.486	0.05	0.00	0.05	0.0004	0.05	0.05
Variance, s^2	0.00	0.003	0.000	0.00	0.00	0.00	0.0000	0.00
Standard Deviation, s	0.00	0.057	0.00	0.01	0.00	0.00	0.00	0.00
Standard Error, s_x	0.00	0.018	0.000	0.00	0.00	0.00	0.000	0.00
Upper Confidence Interval (normal)	0.05	0.511	0.05	0.06	0.05	0.0004	0.05	0.05

Table 3

COMPARISON OF SW-846 STATISTICAL RESULTS
AND REGULATORY THRESHOLDS
FOR METAL ANALYTES

Analyte	90% Upper Confidence Interval per SW-846 (b)	Regulatory Threshold (a)
Metals		
Arsenic	0.05	5.0
Barium	0.511	100.0
Cadmium	0.05	1.0
Chromium	0.06	5.0
Lead	0.05	5.0
Mercury	0.0004	0.2
Selenium	0.05	1.0
Silver	0.05	5.0

(a) 40 CFR Part 261. All units are expressed as milligrams per liter (mg/L).

(b) 90% Upper Confidence Interval as a single-tailed distribution is equivalent to an 80% Upper Confidence Interval as a two-tailed distribution.

APPENDIX A
Element One Inc.
Laboratory and QA/QC Results

Element One Inc.
6319-D Carolina Beach Rd.
Wilmington, NC 28412

Phone: 910 793-0128
Fax: 910 792-6863
e1lab@e1lab.com

elementOne

SUMMARY OF TCLP ANALYSES
Element One, Inc. Project Number e36688

Covanta Honolulu, Inc.
91-174 Hanua Street
Kapolei, HI 96707

May 27, 2021
Client Project Name 2Q21 Units 1&2 Ash Sampling
Client Project Number

Sample ID: HON/CA/04-19-21/04:00/U1&2/1a

Sample Matrix	Combined Ash	Sample Type	Truck	Date Received	05/14/2021
Date Combined	04/19/2021	Time Sampled	0400	Time Received	1130
Sampler		Delivered by	UPS	Received by	LLB
Extraction Begun	05/17/21 1630	Extraction Ended	05/18/21 0900	E1 Sample #	36688-1

Parameter	Result	Unit	Calc. RL	Dilution	DL	Method	Date
Chromium, TCLP digested	0.073	mg/L	0.05	50	0.001	EPA 1311/6020B	05/20/21
Arsenic, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/20/21
Selenium, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/20/21
Silver, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/20/21
Cadmium, TCLP digested	0.050	mg/L	0.05	50	0.001	EPA 1311/6020B	05/20/21
Barium, TCLP digested	0.510	mg/L	0.05	50	0.001	EPA 1311/6020B	05/20/21
Lead, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/20/21
Mercury, TCLP digested	< 0.0004	mg/L	0.0004	2	0.0002	EPA 1311/7470A	05/19/21
Solids	78.1	%				SM2540G	05/17/21
pH, Initial	12.88	SU				EPA 1311	05/17/21
Fluid Determination pH	8.03	SU				EPA 1311	05/17/21
TCLP pH, Final	8.07	SU				EPA 1311	05/18/21
pH, Extraction Fluid #2	2.86	SU				EPA 1311	05/17/21

Ken Smith, Laboratory Director

36688 Covanta Honolulu Quarterly Report 1-10 Compiled by

Certifications: NJ NELAP NC009, NY ELAP 11889, NC DW 37788 and NC DWQ DENR 604

Element One Inc.
6319-D Carolina Beach Rd.
Wilmington, NC 28412

Phone: 910 793-0128
Fax: 910 792-6853
e1lab@e1lab.com

elementOne

SUMMARY OF TOTAL ANALYSES
Element One, Inc. Project Number e36688

Covanta Honolulu, Inc.
91-174 Hanua Street
Kapolei, HI 96707

May 27, 2021
Client Project Name 2Q21 Units 1&2 Ash Sampling
Client Project Number

Sample ID: HON/CA/04-19-21/04:00/U1&2/1a

Sample Matrix	Combined Ash	Sample Type	Truck	Date Received	05/14/2021
Date Combined	04/19/2021	Time Sampled	0400	Time Received	1130
Sampler		Delivered by	UPS	Received by	LLB
				E1 Sample #	36688-1 TOT

Parameter	Result As Received	Result Dry Basis	Unit	Dilution	DL	Method	Date
Chromium, Total	57.9	74.1	mg/kg	25	0.1	EPA 3051/6020B	05/25/21
Arsenic, Total	18.8	24.1	mg/kg	25	0.1	EPA 3051/6020B	05/25/21
Selenium, Total	< 2.45	< 3.14	mg/kg	25	0.1	EPA 3051/6020B	05/25/21
Silver, Total	2.66	3.41	mg/kg	25	0.1	EPA 3051/6020B	05/25/21
Cadmium, Total	15.8	20.2	mg/kg	25	0.1	EPA 3051/6020B	05/25/21
Barium, Total	429	549	mg/kg	25	0.1	EPA 3051/6020B	05/25/21
Lead, Total	919	1177	mg/kg	50	0.1	EPA 3051/6020B	05/25/21
Mercury, Total	0.794	1.02	mg/kg	2	0.2	EPA 3051/7470A	05/27/21
Hexavalent Chromium, Total	< 0.193	< 0.247	mg/kg	10	0.010	EPA 3060A	05/26/21
Total Volatile Residue	3.52		%			SM2540G/E	05/24/21
pH, as received	12.11		SU			EPA 9045D	05/24/21
Solids	78.1		%			SM2540G	05/17/21
Moisture	21.9		%			SM2540G	05/17/21

Ken Smith, Laboratory Director

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Element One Inc.
6319-D Carolina Beach Rd.
Wilmington, NC 28412

Phone: 910 793-0128
Fax: 910 792-6853
e1lab@e1lab.com

elementOne

SUMMARY OF TCLP ANALYSES
Element One, Inc. Project Number e36688

Covanta Honolulu, Inc.
91-174 Hanua Street
Kapolei, HI 96707

May 27, 2021
Client Project Name 2Q21 Units 1&2 Ash Sampling
Client Project Number

Sample ID: HON/CA/04-19-21/21:28/U1&2/2b

Sample Matrix	Combined Ash	Sample Type	Truck	Date Received	05/14/2021
Date Combined	04/19/2021	Time Sampled	2128	Time Received	1130
Sampler		Delivered by	UPS	Received by	LLB
Extraction Begun	05/17/21 1630	Extraction Ended	05/18/21 0900	E1 Sample #	36688-2

Parameter	Result	Unit	Calc. RL	Dilution	DL	Method	Date
Chromium, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/20/21
Arsenic, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/20/21
Selenium, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/20/21
Silver, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/20/21
Cadmium, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/20/21
Barium, TCLP digested	0.623	mg/L	0.05	50	0.001	EPA 1311/6020B	05/20/21
Lead, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/20/21
Mercury, TCLP digested	< 0.0004	mg/L	0.0004	2	0.0002	EPA 1311/7470A	05/19/21
Solids	78.0	%				SM2540G	05/17/21
pH, Initial	12.98	SU				EPA 1311	05/17/21
Fluid Determination pH	12.10	SU				EPA 1311	05/17/21
TCLP pH, Final	10.51	SU				EPA 1311	05/18/21
pH, Extraction Fluid #2	2.86	SU				EPA 1311	05/17/21

Ken Smith, Laboratory Director

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Element One Inc.
6319-D Carolina Beach Rd.
Wilmington, NC 28412

Phone: 910 793-0128
Fax: 910 792-6853
e1lab@e1lab.com

elementOne

SUMMARY OF TOTAL ANALYSES
Element One, Inc. Project Number e36688

Covanta Honolulu, Inc.
91-174 Hanua Street
Kapolei, HI 96707

May 27, 2021
Client Project Name 2Q21 Units 1&2 Ash Sampling
Client Project Number

Sample ID: HON/CA/04-19-21/21:28/U1&2/2b

Sample Matrix	Combined Ash	Sample Type	Truck	Date Received	05/14/2021
Date Combined	04/19/2021	Time Sampled	2128	Time Received	1130
Sampler		Delivered by	UPS	Received by	LLB
				E1 Sample #	36688-2 TOT

Parameter	Result As Received	Result Dry Basis	Unit	Dilution	DL	Method	Date
Chromium, Total	50.8	65.1	mg/kg	25	0.1	EPA 3051/6020B	05/25/21
Arsenic, Total	15.8	20.3	mg/kg	25	0.1	EPA 3051/6020B	05/25/21
Selenium, Total	< 2.32	< 2.97	mg/kg	25	0.1	EPA 3051/6020B	05/25/21
Silver, Total	3.36	4.31	mg/kg	25	0.1	EPA 3051/6020B	05/25/21
Cadmium, Total	15.2	19.5	mg/kg	25	0.1	EPA 3051/6020B	05/25/21
Barium, Total	403	517	mg/kg	25	0.1	EPA 3051/6020B	05/25/21
Lead, Total	840	1077	mg/kg	100	0.1	EPA 3051/6020B	05/25/21
Mercury, Total	0.753	0.965	mg/kg	2	0.2	EPA 3051/7470A	05/27/21
Hexavalent Chromium, Total	< 0.192	< 0.246	mg/kg	10	0.010	EPA 3060A	05/26/21
Total Volatile Residue	5.09		%			SM2540G/E	05/24/21
pH, as received	12.22		SU			EPA 9045D	05/24/21
Solids	78.0		%			SM2540G	05/17/21
Moisture	22.0		%			SM2540G	05/17/21

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Element One Inc.
6319-D Carolina Beach Rd.
Wilmington, NC 28412

Phone: 910 793-0128
Fax: 910 792-6853
e1lab@e1lab.com

elementOne

SUMMARY OF TCLP ANALYSES
Element One, Inc. Project Number e36688

Covanta Honolulu, Inc.
91-174 Hanua Street
Kapolei, HI 96707

May 27, 2021
Client Project Name 2Q21 Units 1&2 Ash Sampling
Client Project Number

Sample ID: HON/CA/04-20-21/02:40/U1&2/3c

Sample Matrix	Combined Ash	Sample Type	Truck	Date Received	05/14/2021
Date Combined	04/20/2021	Time Sampled	0240	Time Received	1130
Sampler		Delivered by	UPS	Received by	LLB
Extraction Begun	05/17/21 1630	Extraction Ended	05/18/21 0900	E1 Sample #	36688-3

Parameter	Result	Unit	Calc. RL	Dilution	DL	Method	Date
Chromium, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/20/21
Arsenic, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/20/21
Selenium, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/20/21
Silver, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/20/21
Cadmium, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/20/21
Barium, TCLP digested	0.440	mg/L	0.05	50	0.001	EPA 1311/6020B	05/20/21
Lead, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/20/21
Mercury, TCLP digested	< 0.0004	mg/L	0.0004	2	0.0002	EPA 1311/7470A	05/19/21
Solids	76.2	%				SM2540G	05/17/21
pH, Initial	12.98	SU				EPA 1311	05/17/21
Fluid Determination pH	11.67	SU				EPA 1311	05/17/21
TCLP pH, Final	10.19	SU				EPA 1311	05/18/21
pH, Extraction Fluid #2	2.86	SU				EPA 1311	05/17/21

Ken Smith, Laboratory Director

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Certifications: NJ NELAP NC009, NY ELAP 11889, NC DW 37788 and NC DWQ DENR 604

Element One Inc.
6319-D Carolina Beach Rd.
Wilmington, NC 28412

Phone: 910 793-0128
Fax: 910 792-6853
e1lab@e1lab.com

elementOne

SUMMARY OF TOTAL ANALYSES
Element One, Inc. Project Number e36688

Covanta Honolulu, Inc.
91-174 Hanua Street
Kapolei, HI 96707

May 27, 2021
Client Project Name 2Q21 Units 1&2 Ash Sampling
Client Project Number

Sample ID: HON/CA/04-20-21/02:40/U1&2/3c

Sample Matrix	Combined Ash	Sample Type	Truck	Date Received	05/14/2021
Date Combined	04/20/2021	Time Sampled	0240	Time Received	1130
Sampler		Delivered by	UPS	Received by	LLB
				E1 Sample #	36688-3 TOT

Parameter	Result As Received	Result Dry Basis	Unit	Dilution	DL	Method	Date
Chromium, Total	50.3	66.0	mg/kg	25	0.1	EPA 3051/6020B	05/25/21
Arsenic, Total	13.9	18.2	mg/kg	25	0.1	EPA 3051/6020B	05/25/21
Selenium, Total	< 2.35	< 3.08	mg/kg	25	0.1	EPA 3051/6020B	05/25/21
Silver, Total	24.4	32.0	mg/kg	25	0.1	EPA 3051/6020B	05/25/21
Cadmium, Total	12.6	16.5	mg/kg	25	0.1	EPA 3051/6020B	05/25/21
Barium, Total	437	573	mg/kg	25	0.1	EPA 3051/6020B	05/25/21
Lead, Total	970	1273	mg/kg	50	0.1	EPA 3051/6020B	05/25/21
Mercury, Total	0.689	0.904	mg/kg	2	0.2	EPA 3051/7470A	05/27/21
Hexavalent Chromium, Total	< 0.195	< 0.256	mg/kg	10	0.010	EPA 3060A	05/26/21
Total Volatile Residue	5.46		%			SM2540G/E	05/24/21
pH, as received	12.15		SU			EPA 9045D	05/24/21
Solids	76.2		%			SM2540G	05/17/21
Moisture	23.8		%			SM2540G	05/17/21

Ken Smith, Laboratory Director

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Certifications: NJ NELAP NC009, NY ELAP 11889, NC DW 37788 and NC DWQ DENR 604

Element One Inc.
6319-D Carolina Beach Rd.
Wilmington, NC 28412

Phone: 910 793-0128
Fax: 910 792-6853
e1lab@e1lab.com

elementOne

SUMMARY OF TCLP ANALYSES
Element One, Inc. Project Number e36688

Covanta Honolulu, Inc.
91-174 Hanua Street
Kapolei, HI 96707

May 27, 2021
Client Project Name 2Q21 Units 1&2 Ash Sampling
Client Project Number

Sample ID: HON/CA/04-21-21/09:00/U1&2/4a

Sample Matrix	Combined Ash	Sample Type	Truck	Date Received	05/14/2021
Date Combined	04/21/2021	Time Sampled	0900	Time Received	1130
Sampler		Delivered by	UPS	Received by	LLB
Extraction Begun	05/17/21 1630	Extraction Ended	05/18/21 0900	E1 Sample #	36688-4

Parameter	Result	Unit	Calc. RL	Dilution	DL	Method	Date
Chromium, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/20/21
Arsenic, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/20/21
Selenium, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/20/21
Silver, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/20/21
Cadmium, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/20/21
Barium, TCLP digested	0.487	mg/L	0.05	50	0.001	EPA 1311/6020B	05/20/21
Lead, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/20/21
Mercury, TCLP digested	< 0.0004	mg/L	0.0004	2	0.0002	EPA 1311/7470A	05/19/21
Solids	80.1	%				SM2540G	05/17/21
pH, Initial	12.99	SU				EPA 1311	05/17/21
Fluid Determination pH	11.09	SU				EPA 1311	05/17/21
TCLP pH, Final	8.29	SU				EPA 1311	05/18/21
pH, Extraction Fluid #2	2.86	SU				EPA 1311	05/17/21

Ken Smith, Laboratory Director

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6319-D Carolina Beach Rd.
Wilmington, NC 28412

Phone: 910 793-0128
Fax: 910 792-6853
e1lab@e1lab.com

elementOne

SUMMARY OF TOTAL ANALYSES
Element One, Inc. Project Number e36688

Covanta Honolulu, Inc.
91-174 Hanua Street
Kapolei, HI 96707

May 27, 2021
Client Project Name 2Q21 Units 1&2 Ash Sampling
Client Project Number

Sample ID: HON/CA/04-21-21/09:00/U1&2/4a

Sample Matrix	Combined Ash	Sample Type	Truck	Date Received	05/14/2021
Date Combined	04/21/2021	Time Sampled	0900	Time Received	1130
Sampler		Delivered by	UPS	Received by	LLB
				E1 Sample #	36688-4 TOT

Parameter	Result As Received	Result Dry Basis	Unit	Dilution	DL	Method	Date
Chromium, Total	54.7	68.3	mg/kg	25	0.1	EPA 3051/6020B	05/25/21
Arsenic, Total	9.42	11.8	mg/kg	25	0.1	EPA 3051/6020B	05/25/21
Selenium, Total	< 2.45	< 3.06	mg/kg	25	0.1	EPA 3051/6020B	05/25/21
Silver, Total	< 2.45	< 3.06	mg/kg	25	0.1	EPA 3051/6020B	05/25/21
Cadmium, Total	4.20	5.24	mg/kg	25	0.1	EPA 3051/6020B	05/25/21
Barium, Total	434	542	mg/kg	25	0.1	EPA 3051/6020B	05/25/21
Lead, Total	358	447	mg/kg	25	0.1	EPA 3051/6020B	05/25/21
Mercury, Total	< 0.196	< 0.245	mg/kg	2	0.2	EPA 3051/7470A	05/27/21
Hexavalent Chromium, Total	0.336	0.419	mg/kg	10	0.010	EPA 3060A	05/26/21
Total Volatile Residue	6.84		%			SM2540G/E	05/24/21
pH, as received	12.10		SU			EPA 9045D	05/24/21
Solids	80.1		%			SM2540G	05/17/21
Moisture	19.9		%			SM2540G	05/17/21

Ken Smith, Laboratory Director

36688 Covanta Honolulu Quarterly Report 1-10 Compiled by DBM

Certifications: NJ NELAP NC009, NY ELAP 11889, NC DW 37788 and NC DWQ DENR 604

Element One Inc.
6319-D Carolina Beach Rd.
Wilmington, NC 28412

Phone: 910 793-0128
Fax: 910 792-6853
e1lab@e1lab.com

elementOne

SUMMARY OF TCLP ANALYSES
Element One, Inc. Project Number e36688

Covanta Honolulu, Inc.
91-174 Hanua Street
Kapolei, HI 96707

May 27, 2021
Client Project Name 2Q21 Units 1&2 Ash Sampling
Client Project Number

Sample ID: HON/CA/04-21-21/11:00/U1&2/5b

Sample Matrix	Combined Ash	Sample Type	Truck	Date Received	05/14/2021
Date Combined	04/21/2021	Time Sampled	1100	Time Received	1130
Sampler		Delivered by	UPS	Received by	LLB
Extraction Begun	05/17/21 1630	Extraction Ended	05/18/21 0900	E1 Sample #	36688-5

Parameter	Result	Unit	Calc. RL	Dilution	DL	Method	Date
Chromium, TCLP digested	0.069	mg/L	0.05	50	0.001	EPA 1311/6020B	05/20/21
Arsenic, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/20/21
Selenium, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/20/21
Silver, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/20/21
Cadmium, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/20/21
Barium, TCLP digested	0.398	mg/L	0.05	50	0.001	EPA 1311/6020B	05/20/21
Lead, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/20/21
Mercury, TCLP digested	< 0.0004	mg/L	0.0004	2	0.0002	EPA 1311/7470A	05/19/21
Solids	77.5	%				SM2540G	05/17/21
pH, Initial	12.98	SU				EPA 1311	05/17/21
Fluid Determination pH	11.83	SU				EPA 1311	05/17/21
TCLP pH, Final	10.40	SU				EPA 1311	05/18/21
pH, Extraction Fluid #2	2.86	SU				EPA 1311	05/17/21

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Element One Inc.
6319-D Carolina Beach Rd.
Wilmington, NC 28412

Phone: 910 793-0128
Fax: 910 792-6853
e1lab@e1lab.com

elementOne

SUMMARY OF TOTAL ANALYSES
Element One, Inc. Project Number e36688

Covanta Honolulu, Inc.
91-174 Hanua Street
Kapolei, HI 96707

May 27, 2021
Client Project Name 2Q21 Units 1&2 Ash Sampling
Client Project Number

Sample ID: HON/CA/04-21-21/11:00/U1&2/5b

Sample Matrix	Combined Ash	Sample Type	Truck	Date Received	05/14/2021
Date Combined	04/21/2021	Time Sampled	1100	Time Received	1130
Sampler		Delivered by	UPS	Received by	LLB
				E1 Sample #	36688-5 TOT

Parameter	Result As Received	Result Dry Basis	Unit	Dilution	DL	Method	Date
Chromium, Total	59.9	77.3	mg/kg	25	0.1	EPA 3051/6020B	05/25/21
Arsenic, Total	10.9	14.1	mg/kg	25	0.1	EPA 3051/6020B	05/25/21
Selenium, Total	< 2.36	< 3.05	mg/kg	25	0.1	EPA 3051/6020B	05/25/21
Silver, Total	4.79	6.18	mg/kg	25	0.1	EPA 3051/6020B	05/25/21
Cadmium, Total	6.53	8.43	mg/kg	25	0.1	EPA 3051/6020B	05/25/21
Barium, Total	943	1217	mg/kg	50	0.1	EPA 3051/6020B	05/25/21
Lead, Total	350	452	mg/kg	25	0.1	EPA 3051/6020B	05/25/21
Mercury, Total	0.253	0.326	mg/kg	2	0.2	EPA 3051/7470A	05/27/21
Hexavalent Chromium, Total	0.218	0.281	mg/kg	10	0.010	EPA 3060A	05/26/21
Total Volatile Residue	5.38		%			SM2540G/E	05/24/21
pH, as received	12.26		SU			EPA 9045D	05/24/21
Solids	77.5		%			SM2540G	05/17/21
Moisture	22.5		%			SM2540G	05/17/21

Ken Smith, Laboratory Director

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Element One Inc.
6319-D Carolina Beach Rd.
Wilmington, NC 28412

Phone: 910 793-0128
Fax: 910 792-6853
e1lab@e1lab.com

elementOne

SUMMARY OF TCLP ANALYSES
Element One, Inc. Project Number e36688

Covanta Honolulu, Inc.
91-174 Hanua Street
Kapolei, HI 96707

May 27, 2021
Client Project Name 2Q21 Units 1&2 Ash Sampling
Client Project Number

Sample ID: HON/CA/04-22-21/22:30/U1&2/6c

Sample Matrix	Combined Ash	Sample Type	Truck	Date Received	05/14/2021
Date Combined	04/22/2021	Time Sampled	2230	Time Received	1130
Sampler		Delivered by	UPS	Received by	LLB
Extraction Begun	05/17/21 1630	Extraction Ended	05/18/21 0900	E1 Sample #	36688-6

Parameter	Result	Unit	Calc. RL	Dilution	DL	Method	Date
Chromium, TCLP digested	0.067	mg/L	0.05	50	0.001	EPA 1311/6020B	05/20/21
Arsenic, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/20/21
Selenium, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/20/21
Silver, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/20/21
Cadmium, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/20/21
Barium, TCLP digested	0.473	mg/L	0.05	50	0.001	EPA 1311/6020B	05/20/21
Lead, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/20/21
Mercury, TCLP digested	< 0.0004	mg/L	0.0004	2	0.0002	EPA 1311/7470A	05/19/21
Solids	79.9	%				SM2540G	05/17/21
pH, Initial	12.97	SU				EPA 1311	05/17/21
Fluid Determination pH	11.90	SU				EPA 1311	05/17/21
TCLP pH, Final	9.27	SU				EPA 1311	05/18/21
pH, Extraction Fluid #2	2.86	SU				EPA 1311	05/17/21

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Element One Inc.
6319-D Carolina Beach Rd.
Wilmington, NC 28412

Phone: 910 793-0128
Fax: 910 792-6853
e1lab@e1lab.com

elementOne

SUMMARY OF TOTAL ANALYSES
Element One, Inc. Project Number e36688

Covanta Honolulu, Inc.
91-174 Hanua Street
Kapolei, HI 96707

May 27, 2021
Client Project Name 2Q21 Units 1&2 Ash Sampling
Client Project Number

Sample ID: HON/CA/04-22-21/22:30/U1&2/6c

Sample Matrix	Combined Ash	Sample Type	Truck	Date Received	05/14/2021
Date Combined	04/22/2021	Time Sampled	2230	Time Received	1130
Sampler		Delivered by	UPS	Received by	LLB
				E1 Sample #	36688-6 TOT

Parameter	Result As Received	Result Dry Basis	Unit	Dilution	DL	Method	Date
Chromium, Total	41.1	51.4	mg/kg	25	0.1	EPA 3051/6020B	05/25/21
Arsenic, Total	17.1	21.4	mg/kg	25	0.1	EPA 3051/6020B	05/25/21
Selenium, Total	< 2.49	< 3.12	mg/kg	25	0.1	EPA 3051/6020B	05/25/21
Silver, Total	2.63	3.29	mg/kg	25	0.1	EPA 3051/6020B	05/25/21
Cadmium, Total	13.0	16.3	mg/kg	25	0.1	EPA 3051/6020B	05/25/21
Barium, Total	274	343	mg/kg	25	0.1	EPA 3051/6020B	05/25/21
Lead, Total	954	1194	mg/kg	50	0.1	EPA 3051/6020B	05/25/21
Mercury, Total	0.562	0.703	mg/kg	2	0.2	EPA 3051/7470A	05/27/21
Hexavalent Chromium, Total	< 0.198	< 0.248	mg/kg	10	0.010	EPA 3060A	05/26/21
Total Volatile Residue	4.71		%			SM2540G/E	05/24/21
pH, as received	12.35		SU			EPA 9045D	05/24/21
Solids	79.9		%			SM2540G	05/17/21
Moisture	20.1		%			SM2540G	05/17/21

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Element One Inc.
6319-D Carolina Beach Rd.
Wilmington, NC 28412

Phone: 910 793-0128
Fax: 910 792-6853
e1lab@e1lab.com

elementOne

SUMMARY OF TCLP ANALYSES
Element One, Inc. Project Number e36688

Covanta Honolulu, Inc.
91-174 Hanua Street
Kapolei, HI 96707

May 27, 2021
Client Project Name 2Q21 Units 1&2 Ash Sampling
Client Project Number

Sample ID: HON/CA/04-23-21/04:30/U1&2/7a

Sample Matrix	Combined Ash	Sample Type	Truck	Date Received	05/14/2021
Date Combined	04/23/2021	Time Sampled	0430	Time Received	1130
Sampler		Delivered by	UPS	Received by	LLB
Extraction Begun	05/17/21 1630	Extraction Ended	05/18/21 0900	E1 Sample #	36688-7

Parameter	Result	Unit	Calc. RL	Dilution	DL	Method	Date
Chromium, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/20/21
Arsenic, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/20/21
Selenium, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/20/21
Silver, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/20/21
Cadmium, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/20/21
Barium, TCLP digested	0.493	mg/L	0.05	50	0.001	EPA 1311/6020B	05/20/21
Lead, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/20/21
Mercury, TCLP digested	< 0.0004	mg/L	0.0004	2	0.0002	EPA 1311/7470A	05/19/21
Solids	79.1	%				SM2540G	05/17/21
pH, Initial	12.77	SU				EPA 1311	05/17/21
Fluid Determination pH	11.57	SU				EPA 1311	05/17/21
TCLP pH, Final	8.02	SU				EPA 1311	05/18/21
pH, Extraction Fluid #2	2.86	SU				EPA 1311	05/17/21

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Element One Inc.
6319-D Carolina Beach Rd.
Wilmington, NC 28412

Phone: 910 793-0128
Fax: 910 792-6853
e1lab@e1lab.com

elementOne

SUMMARY OF TOTAL ANALYSES
Element One, Inc. Project Number e36688

Covanta Honolulu, Inc.
91-174 Hanua Street
Kapolei, HI 96707

May 27, 2021
Client Project Name 2Q21 Units 1&2 Ash Sampling
Client Project Number

Sample ID: HON/CA/04-23-21/04:30/U1&2/7a

Sample Matrix	Combined Ash	Sample Type	Truck	Date Received	05/14/2021
Date Combined	04/23/2021	Time Sampled	0430	Time Received	1130
Sampler		Delivered by	UPS	Received by	LLB
				E1 Sample #	36688-7 TOT

Parameter	Result As Received	Result Dry Basis	Unit	Dilution	DL	Method	Date
Chromium, Total	66.7	84.3	mg/kg	25	0.1	EPA 3051/6020B	05/25/21
Arsenic, Total	19.8	25.0	mg/kg	25	0.1	EPA 3051/6020B	05/25/21
Selenium, Total	< 2.28	< 2.88	mg/kg	25	0.1	EPA 3051/6020B	05/25/21
Silver, Total	< 2.28	< 2.88	mg/kg	25	0.1	EPA 3051/6020B	05/25/21
Cadmium, Total	15.3	19.3	mg/kg	25	0.1	EPA 3051/6020B	05/25/21
Barium, Total	460	582	mg/kg	25	0.1	EPA 3051/6020B	05/25/21
Lead, Total	1722	2177	mg/kg	100	0.1	EPA 3051/6020B	05/25/21
Mercury, Total	0.495	0.626	mg/kg	2	0.2	EPA 3051/7470A	05/27/21
Hexavalent Chromium, Total	0.255	0.322	mg/kg	10	0.010	EPA 3060A	05/26/21
Total Volatile Residue	3.76		%			SM2540G/E	05/24/21
pH, as received	12.01		SU			EPA 9045D	05/24/21
Solids	79.1		%			SM2540G	05/17/21
Moisture	20.9		%			SM2540G	05/17/21

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Element One Inc.
6319-D Carolina Beach Rd.
Wilmington, NC 28412

Phone: 910 793-0128
Fax: 910 792-6853
e1lab@e1lab.com

elementOne

SUMMARY OF TCLP ANALYSES
Element One, Inc. Project Number e36688

Covanta Honolulu, Inc.
91-174 Hanua Street
Kapolei, HI 96707

May 27, 2021
Client Project Name 2Q21 Units 1&2 Ash Sampling
Client Project Number

Sample ID: HON/CA/04-23-21/12:45/U1&2/8b

Sample Matrix	Combined Ash	Sample Type	Truck	Date Received	05/14/2021
Date Combined	04/23/2021	Time Sampled	1245	Time Received	1130
Sampler		Delivered by	UPS	Received by	LLB
Extraction Begun	05/17/21 1630	Extraction Ended	05/18/21 0900	E1 Sample #	36688-8

Parameter	Result	Unit	Calc. RL	Dilution	DL	Method	Date
Chromium, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/20/21
Arsenic, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/20/21
Selenium, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/20/21
Silver, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/20/21
Cadmium, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/20/21
Barium, TCLP digested	0.480	mg/L	0.05	50	0.001	EPA 1311/6020B	05/20/21
Lead, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/20/21
Mercury, TCLP digested	< 0.0004	mg/L	0.0004	2	0.0002	EPA 1311/7470A	05/19/21
Solids	78.7	%				SM2540G	05/17/21
pH, Initial	12.99	SU				EPA 1311	05/17/21
Fluid Determination pH	8.50	SU				EPA 1311	05/17/21
TCLP pH, Final	9.42	SU				EPA 1311	05/18/21
pH, Extraction Fluid #2	2.86	SU				EPA 1311	05/17/21

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Element One Inc.
6319-D Carolina Beach Rd.
Wilmington, NC 28412

Phone: 910 793-0128
Fax: 910 792-6853
e1lab@e1lab.com

elementOne

SUMMARY OF TOTAL ANALYSES
Element One, Inc. Project Number e36688

Covanta Honolulu, Inc.
91-174 Hanua Street
Kapolei, HI 96707

May 27, 2021
Client Project Name 2Q21 Units 1&2 Ash Sampling
Client Project Number

Sample ID: HON/CA/04-23-21/12:45/U1&2/8b

Sample Matrix	Combined Ash	Sample Type	Truck	Date Received	05/14/2021
Date Combined	04/23/2021	Time Sampled	1245	Time Received	1130
Sampler		Delivered by	UPS	Received by	LLB
				E1 Sample #	36688-8 TOT

Parameter	Result As Received	Result Dry Basis	Unit	Dilution	DL	Method	Date
Chromium, Total	39.4	50.1	mg/kg	25	0.1	EPA 3051/6020B	05/25/21
Arsenic, Total	19.2	24.4	mg/kg	25	0.1	EPA 3051/6020B	05/25/21
Selenium, Total	< 2.17	< 2.76	mg/kg	25	0.1	EPA 3051/6020B	05/25/21
Silver, Total	2.54	3.23	mg/kg	25	0.1	EPA 3051/6020B	05/25/21
Cadmium, Total	17.6	22.7	mg/kg	25	0.1	EPA 3051/6020B	05/25/21
Barium, Total	284	361	mg/kg	25	0.1	EPA 3051/6020B	05/25/21
Lead, Total	773	982	mg/kg	50	0.1	EPA 3051/6020B	05/25/21
Mercury, Total	0.706	0.897	mg/kg	2	0.2	EPA 3051/7470A	05/27/21
Hexavalent Chromium, Total	< 0.194	< 0.247	mg/kg	10	0.010	EPA 3060A	05/26/21
Total Volatile Residue	5.52		%			SM2540G/E	05/24/21
pH, as received	12.10		SU			EPA 9045D	05/24/21
Solids	78.7		%			SM2540G	05/17/21
Moisture	21.3		%			SM2540G	05/17/21

Ken Smith, Laboratory Director

36688 Covanta Honolulu Quarterly Report 1-10 Compiled by

Certifications: NJ NELAP NC009, NY ELAP 11889, NC DW 37788 and NC DWQ DENR 604

Element One Inc.
6319-D Carolina Beach Rd.
Wilmington, NC 28412

Phone: 910 793-0128
Fax: 910 792-6853
e1lab@e1lab.com

elementOne

SUMMARY OF TCLP ANALYSES
Element One, Inc. Project Number e36688

Covanta Honolulu, Inc.
91-174 Hanua Street
Kapolei, HI 96707

May 27, 2021
Client Project Name 2Q21 Units 1&2 Ash Sampling
Client Project Number

Sample ID: HON/CA/04-28-21/15:15/U1&2/9c

Sample Matrix	Combined Ash	Sample Type	Truck	Date Received	05/14/2021
Date Combined	04/28/2021	Time Sampled	1515	Time Received	1130
Sampler		Delivered by	UPS	Received by	LLB
Extraction Begun	05/17/21 1630	Extraction Ended	05/18/21 0900	E1 Sample #	36688-9

Parameter	Result	Unit	Calc. RL	Dilution	DL	Method	Date
Chromium, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/20/21
Arsenic, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/20/21
Selenium, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/20/21
Silver, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/20/21
Cadmium, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/20/21
Barium, TCLP digested	0.484	mg/L	0.05	50	0.001	EPA 1311/6020B	05/20/21
Lead, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/20/21
Mercury, TCLP digested	< 0.0004	mg/L	0.0004	2	0.0002	EPA 1311/7470A	05/19/21
Solids	77.1	%				SM2540G	05/17/21
pH, Initial	12.99	SU				EPA 1311	05/17/21
Fluid Determination pH	11.83	SU				EPA 1311	05/17/21
TCLP pH, Final	9.98	SU				EPA 1311	05/18/21
pH, Extraction Fluid #2	2.86	SU				EPA 1311	05/17/21

Ken Smith, Laboratory Director

36688 Covanta Honolulu Quarterly Report 1-10 Compiled by

Certifications: NJ NELAP NC009, NY ELAP 11889, NC DW 37788 and NC DWQ DENR 604

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Fax: 910 792-6853
e1lab@e1lab.com

elementOne

SUMMARY OF TOTAL ANALYSES
Element One, Inc. Project Number e36688

Covanta Honolulu, Inc.
91-174 Hanua Street
Kapolei, HI 96707

May 27, 2021
Client Project Name 2Q21 Units 1&2 Ash Sampling
Client Project Number

Sample ID: HON/CA/04-28-21/15:15/U1&2/9c

Sample Matrix	Combined Ash	Sample Type	Truck	Date Received	05/14/2021
Date Combined	04/28/2021	Time Sampled	1515	Time Received	1130
Sampler		Delivered by	UPS	Received by	LLB
				E1 Sample #	36688-9 TOT

Parameter	Result As Received	Result Dry Basis	Unit	Dilution	DL	Method	Date
Chromium, Total	69.7	90.4	mg/kg	25	0.1	EPA 3051/6020B	05/25/21
Arsenic, Total	24.0	31.1	mg/kg	25	0.1	EPA 3051/6020B	05/25/21
Selenium, Total	< 2.41	< 3.13	mg/kg	25	0.1	EPA 3051/6020B	05/25/21
Silver, Total	8.03	10.4	mg/kg	25	0.1	EPA 3051/6020B	05/25/21
Cadmium, Total	31.1	40.3	mg/kg	25	0.1	EPA 3051/6020B	05/25/21
Barium, Total	454	589	mg/kg	25	0.1	EPA 3051/6020B	05/25/21
Lead, Total	1428	1852	mg/kg	100	0.1	EPA 3051/6020B	05/25/21
Mercury, Total	0.572	0.742	mg/kg	2	0.2	EPA 3051/7470A	05/27/21
Hexavalent Chromium, Total	< 0.193	< 0.250	mg/kg	10	0.010	EPA 3060A	05/26/21
Total Volatile Residue	4.48		%			SM2540G/E	05/24/21
pH, as received	12.14		SU			EPA 9045D	05/24/21
Solids	77.1		%			SM2540G	05/17/21
Moisture	22.9		%			SM2540G	05/17/21

Ken Smith, Laboratory Director

36688 Covanta Honolulu Quarterly Report 1-10 Compiled by

Certifications: NJ NELAP NC009, NY ELAP 11889, NC DW 37788 and NC DWQ DENR 604

Element One Inc.
6319-D Carolina Beach Rd.
Wilmington, NC 28412

Phone: 910 793-0128
Fax: 910 792-6853
e1lab@e1lab.com

elementOne

SUMMARY OF TCLP ANALYSES
Element One, Inc. Project Number e36688

Covanta Honolulu, Inc.
91-174 Hanua Street
Kapolei, HI 96707

May 27, 2021
Client Project Name 2Q21 Units 1&2 Ash Sampling
Client Project Number

Sample ID: HON/CA/04-29-21/09:35/U1&2/10a

Sample Matrix	Combined Ash	Sample Type	Truck	Date Received	05/14/2021
Date Combined	04/29/2021	Time Sampled	0935	Time Received	1130
Sampler		Delivered by	UPS	Received by	LLB
Extraction Begun	05/17/21 1630	Extraction Ended	05/18/21 0900	E1 Sample #	36688-10

Parameter	Result	Unit	Calc. RL	Dilution	DL	Method	Date
Chromium, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/20/21
Arsenic, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/20/21
Selenium, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/20/21
Silver, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/20/21
Cadmium, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/20/21
Barium, TCLP digested	0.470	mg/L	0.05	50	0.001	EPA 1311/6020B	05/20/21
Lead, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/20/21
Mercury, TCLP digested	< 0.0004	mg/L	0.0004	2	0.0002	EPA 1311/7470A	05/19/21
Solids	75.4	%				SM2540G	05/17/21
pH, Initial	12.99	SU				EPA 1311	05/17/21
Fluid Determination pH	12.18	SU				EPA 1311	05/17/21
TCLP pH, Final	9.78	SU				EPA 1311	05/18/21
pH, Extraction Fluid #2	2.86	SU				EPA 1311	05/17/21

Ken Smith, Laboratory Director

36688 Covanta Honolulu Quarterly Report 1-10 Compiled by

Certifications: NJ NELAP NC009, NY ELAP 11889, NC DW 37788 and NC DWQ DENR 604

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6319-D Carolina Beach Rd.
Wilmington, NC 28412

Phone: 910 793-0128
Fax: 910 792-6853
e1lab@e1lab.com

elementOne

SUMMARY OF TOTAL ANALYSES
Element One, Inc. Project Number e36688

Covanta Honolulu, Inc.
91-174 Hanua Street
Kapolei, HI 96707

May 27, 2021
Client Project Name 2Q21 Units 1&2 Ash Sampling
Client Project Number

Sample ID: HON/CA/04-29-21/09:35/U1&2/10a

Sample Matrix	Combined Ash	Sample Type	Truck	Date Received	05/14/2021
Date Combined	04/29/2021	Time Sampled	0935	Time Received	1130
Sampler		Delivered by	UPS	Received by	LLB
				E1 Sample #	36688-10 TOT

Parameter	Result As Received	Result Dry Basis	Unit	Dilution	DL	Method	Date
Chromium, Total	35.8	47.9	mg/kg	25	0.1	EPA 3051/6020B	05/25/21
Arsenic, Total	12.4	16.4	mg/kg	25	0.1	EPA 3051/6020B	05/25/21
Selenium, Total	< 2.43	< 3.22	mg/kg	25	0.1	EPA 3051/6020B	05/25/21
Silver, Total	12.1	16.0	mg/kg	25	0.1	EPA 3051/6020B	05/25/21
Cadmium, Total	13.4	17.8	mg/kg	25	0.1	EPA 3051/6020B	05/25/21
Barium, Total	224	297	mg/kg	25	0.1	EPA 3051/6020B	05/25/21
Lead, Total	674	894	mg/kg	50	0.1	EPA 3051/6020B	05/25/21
Mercury, Total	0.381	0.505	mg/kg	2	0.2	EPA 3051/7470A	05/27/21
Hexavalent Chromium, Total	< 0.194	< 0.257	mg/kg	10	0.010	EPA 3060A	05/26/21
Total Volatile Residue	4.79		%			SM2540G/E	05/24/21
pH, as received	12.19		SU			EPA 9045D	05/24/21
Solids	75.4		%			SM2540G	05/17/21
Moisture	24.6		%			SM2540G	05/17/21

Ken Smith, Laboratory Director

36688 Covanta Honolulu Quarterly Report 1-10 Compiled by

Certifications: NJ NELAP NC009, NY ELAP 11889, NC DW 37788 and NC DWQ DENR 604

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CHAIN OF CUSTODY – ASH

Lab ID#: 36688

Facility	Covanta Honolulu H-Power	PO#		Report to (Email)	kasato@covanta.com	+ Email ID	jdoyne@covanta.com
Address	91-174 Hanua Street, Kapolei HI 96707	Billing information, if different				+ Email ID	
Contact Name	Katelyn Asato	Email	kasato@covanta.com	Phone 808-426-0857	Fax 808-682-5208	Project ID	2021 Units 1&2 Ash Sampling
Delivery Date		TAT (circle one)	Normal	Rush	1-Day 2-Day 3-Day		

*Instructions: Use legend shown below to identify Purpose, Sample Location, Ash Type and Sample Type. For changes to this form, contact the Corporate Ash Team. *R&D samples are not entered in to EMIS*

Purpose	Sample Location		Ash Type	Sample Type				Other
Characterize	Cell	FE/Pile/End Loader	Combined Ash: CA	Composite				Other
Process Knowledge	Grate	Truck	Bottom Ash: BA	1-Hr: 1H	8-Hr: 8H	Random: RC	[illegible]	Grab: GR
R&D	Pile	Stone Site	Fly Ash: FA	4-Hr: 4H	12-Hr: 12H	Quarter: QC	[illegible]	
	Pit	Dust Barrier	Ratio Sample: RS	6-Hr: 6H	Daily: DC	Truck: TR		
	Belt/Conveyor			7-Hr: 7H	Weekly: WC	Day Shift: AM		

Analyses Requested

Ref No.	Sample ID on Label (Facility/Date/Ash Type/Location/Time)	Purpose	Sample Location	Ash Type	Sample Type	Sample #	Aliquot #	Sample Collection Start Date	Sample Collection Start Time	# Container (s)	TCLP Fluid pH	TCLP Metals	Total Metals 6020	pH 9045	Hg 7470A	Hexavalent Cr 3060A / 7199	% Volatiles, Moisture	Alkalinity / mEq	Remarks
1	HON / CA / 04-19-21 / 04:00 / U1&2 / 1a	Characterize	Pile	CA	TR	1	1	4/19/2021	4:00 AM	1	X	X	X	X	X	X	X	X	Please pick 1 of 3 aliquots to analyze
2	HON / CA / 04-19-21 / 04:00 / U1&2 / 1b	Characterize	Pile	CA	TR	1	2	4/19/2021	4:00 AM	1									
3	HON / CA / 04-19-21 / 04:00 / U1&2 / 1c	Characterize	Pile	CA	TR	1	3	4/19/2021	4:00 AM	1									
4	HON / CA / 04-19-21 / 21:28 / U1&2 / 2a	Characterize	Pile	CA	TR	1	1	4/19/2021	9:28 PM	1	X	X	X	X	X	X	X	X	Please pick 1 of 3 aliquots to analyze
5	HON / CA / 04-19-21 / 21:28 / U1&2 / 2b	Characterize	Pile	CA	TR	1	2	4/19/2021	9:28 PM	1									
6	HON / CA / 04-19-21 / 21:28 / U1&2 / 2c	Characterize	Pile	CA	TR	1	3	4/19/2021	9:28 PM	1									
7	HON / CA / 04-20-21 / 02:40 / U1&2 / 3a	Characterize	Pile	CA	TR	1	1	4/20/2021	2:40 AM	1	X	X	X	X	X	X	X	X	Please pick 1 of 3 aliquots to analyze
8	HON / CA / 04-20-21 / 02:40 / U1&2 / 3b	Characterize	Pile	CA	TR	1	2	4/20/2021	2:40 AM	1									
9	HON / CA / 04-20-21 / 02:40 / U1&2 / 3c	Characterize	Pile	CA	TR	1	3	4/20/2021	2:40 AM	1									
10	HON / CA / 04-21-21 / 09:00 / U1&2 / 4a	Characterize	Pile	CA	TR	1	1	4/21/2021	9:00 AM	1	X	X	X	X	X	X	X	X	Please pick 1 of 3 aliquots to analyze
11	HON / CA / 04-21-21 / 09:00 / U1&2 / 4b	Characterize	Pile	CA	TR	1	2	4/21/2021	9:00 AM	1									
12	HON / CA / 04-21-21 / 09:00 / U1&2 / 4c	Characterize	Pile	CA	TR	1	3	4/21/2021	9:00 AM	1									
13	HON / CA / 04-21-21 / 11:00 / U1&2 / 5a	Characterize	Pile	CA	TR	1	1	4/21/2021	11:00 AM	1	X	X	X	X	X	X	X	X	Please pick 1 of 3 aliquots to analyze
14	HON / CA / 04-21-21 / 11:00 / U1&2 / 5b	Characterize	Pile	CA	TR	1	2	4/21/2021	11:00 AM	1									
15	HON / CA / 04-21-21 / 11:00 / U1&2 / 5c	Characterize	Pile	CA	TR	1	3	4/21/2021	11:00 AM	1									

Notes: Please pick 1 of the 3 provided aliquots to first analyze for TCLP pH. Please contact Johne or Katelyn with pH value to complete other analyses.

Relinquished by	Name	[signature]	Date 5-12-21	Time 11:00	Signature		
Received by	Name	Lisa Britton	Date 5-14-21	Time 1130	Signature	Lisa Britton	
Lab Notes							

COVANTA
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CHAIN OF CUSTODY – ASH

Lab ID # 36688

Facility	Covanta Honolulu H-Power	Report to (Email)	kasato@covanta.com
Address	91-174 Hanua Street, Kapolei HI 96707	Email ID	jgwynne@covanta.com
Contact Name	Katalyn Asato	Email	kasato@covanta.com
Phone	808-428-0852	Fax	808-682-5203
Project	2021 Units 1&2 Ash Sampling		
Delivery Date		TAT	Normal

Instructions: Use legend shown below to identify Purpose, Sample Location, Ash Type and Sample Type. For changes to this form, contact the Corporate Ash Team. *R&D samples are not entered in to EMIS

Purpose	Sample Location		Ash Type	Sample Type				Other
Characterize	Pile	FEL Front End Loader	Combined Ash: CA	Composite				
Process Knowledge	Crane	Truck	Bottom Ash: BA	2 Hr: 2H	4 Hr: 4H	Monthly: MO	Night Shift: PM	Grab: GR
R&D	Pile	Super Sac	Fly Ash: FA	4 Hr: 4H	12 Hr: HD	Quarterly: QC		
	Pugmill	Dust Master	Ratio Sample: RS	6 Hr: 6H	Daily: DC	Truck: TR		
	Self Dump			7 Hr: 7H	Weekly: WO	Day Shift: AM		

Analyses Requested: TCLP Fluid pH; TCLP Metals; Total Metals 6020; pH 9045; Hg 7470A; Hexavalent Cr 3060A / 7199; % Volatiles, Moisture; Alkalinity / mEq

Notes: Please pick 1 of the 3 provided aliquots to first analyze for TCLP pH. Please contact John or Katelyn with TCLP pH prior to completing other analysis.

Ref No.	Sample ID on Label	Purpose	Sample Location	Ash Type	Sample Type	Sample #	Aliquot #	Sample Collection Start Date	Sample Collection Start Time	# Container (#)	TCLP Fluid pH	TCLP Metals	Total Metals 6020	pH 9045	Hg 7470A	Hexavalent Cr 3060A / 7199	% Volatiles, Moisture	Alkalinity / mEq	Remarks
16	HON / CA / 04-22-21 / 22:30 / U1&2 / 6a	Characterize	Pile	CA	TR	1	1	4/22/2021	10:30 PM	1	X	X	X	X	X	X	X	X	Please pick 1 of 3 aliquots to analyze
17	HON / CA / 04-22-21 / 22:30 / U1&2 / 6b	Characterize	Pile	CA	TR	1	2	4/22/2021	10:30 PM	1									
18	HON / CA / 04-22-21 / 22:30 / U1&2 / 6c	Characterize	Pile	CA	TR	1	3	4/22/2021	10:30 PM	1									
19	HON / CA / 04-23-21 / 04:30 / U1&2 / 7a	Characterize	Pile	CA	TR	1	1	4/23/2021	4:30 AM	1	X	X	X	X	X	X	X	X	Please pick 1 of 3 aliquots to analyze
20	HON / CA / 04-23-21 / 04:30 / U1&2 / 7b	Characterize	Pile	CA	TR	1	2	4/23/2021	4:30 AM	1									
21	HON / CA / 04-23-21 / 04:30 / U1&2 / 7c	Characterize	Pile	CA	TR	1	3	4/23/2021	4:30 AM	1									
22	HON / CA / 04-23-21 / 12:45 / U1&2 / 8a	Characterize	Pile	CA	TR	1	1	4/23/2021	12:45 PM	1	X	X	X	X	X	X	X	X	Please pick 1 of 3 aliquots to analyze
23	HON / CA / 04-23-21 / 12:45 / U1&2 / 8b	Characterize	Pile	CA	TR	1	2	4/23/2021	12:45 PM	1									
24	HON / CA / 04-23-21 / 12:45 / U1&2 / 8c	Characterize	Pile	CA	TR	1	3	4/23/2021	12:45 PM	1									
25	HON / CA / 04-28-21 / 15:15 / U1&2 / 9a	Characterize	Pile	CA	TR	1	1	4/28/2021	3:15 PM	1	X	X	X	X	X	X	X	X	Please pick 1 of 3 aliquots to analyze
26	HON / CA / 04-28-21 / 15:15 / U1&2 / 9b	Characterize	Pile	CA	TR	1	2	4/28/2021	3:15 PM	1									
27	HON / CA / 04-28-21 / 15:15 / U1&2 / 9c	Characterize	Pile	CA	TR	1	3	4/28/2021	3:15 PM	1									
28	HON / CA / 04-29-21 / 09:35 / U1&2 / 10a	Characterize	Pile	CA	TR	1	1	4/29/2021	9:35 AM	1	X	X	X	X	X	X	X	X	Please pick 1 of 3 aliquots to analyze
29	HON / CA / 04-29-21 / 09:35 / U1&2 / 10b	Characterize	Pile	CA	TR	1	2	4/29/2021	9:35 AM	1									
30	HON / CA / 04-29-21 / 09:35 / U1&2 / 10c	Characterize	Pile	CA	TR	1	3	4/29/2021	9:35 AM	1									

Relinquished by	Name: [signature]	Date: 5-12-21	Time: 11:00	Signature:
Received by	Name: Lisa Broton	Date: 5.14.21	Time: 1130	Signature: [signature]
Lab Notes				

APPENDIX B

Pace Analytical Services, LLC.
Laboratory and QA/QC Results

Pace Analytical™
www.pacelabs.com

Pace Analytical Services, LLC.
1700 Elm Street
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444

Report Prepared for:

Katelyn Asato
Covanta
91-174 Hanua St.
Kapolei HI 96707

REPORT OF LABORATORY ANALYSIS FOR PCDD/PCDF

Report Prepared Date:
May 27, 2021

Report Information:

Pace Project #: 10560322
Sample Receipt Date: 05/14/2021
Client Project #: Q2-2021 RDF Ash Sampling
Client Sub PO #: HONOL-0000081557
State Cert #: N/A

Invoicing & Reporting Options:

The report provided has been invoiced as a Level 2 PCDD/PCDF Report. If an upgrade of this report package is requested, an additional charge may be applied.

Please review the attached invoice for accuracy and forward any questions to Ashley Williams, your Pace Project Manager.

This report has been reviewed by:

June 02, 2021
Ashley Williams, Project Manager
(612) 346-8158
(612) 607-6444 (fax)
ashley.williams@pacelabs.com

NELAP ACCREDITED TNI LABORATORY

Report of Laboratory Analysis

The results relate only to the samples included in this report.

Pace Analytical™

Pace Analytical Services, LLC.
1700 Elm Street
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444

DISCUSSION

This report presents the results from the analysis performed on one sample submitted by a representative of Covanta. The sample was analyzed for the presence or absence of polychlorodibenzo-p-dioxins (PCDDs) and polychlorodibenzofurans (PCDFs) using a modified version of USEPA Method 8290. The reporting limits were set to correspond to the lowest calibration points and a nominal 10-gram sample amount, and the sensitivity was verified by signal-to-noise measurements. The quantitation limits, adjusted for sample extraction amount, may be somewhat higher or lower than the reporting limits provided in this report. Estimated maximum possible concentration (EMPC) values were treated as positives in the toxic equivalence calculations. The sample was received above the recommended temperature range of 0-6 degrees Celsius.

Second column confirmation analyses of 2,3,7,8-TCDF values obtained from the primary (DB5-MS) column are performed only when specifically requested for a project and only when the values are above the concentration of the lowest calibration standard. Typical resolution for this isomer using the DB5-MS column ranges from 25-30%.

The isotopically-labeled PCDD/PCDF internal standards in the sample extract were recovered at 49-92%. All of the labeled internal standard recoveries obtained for this project were within the 40-135% target range specified in Method 8290. Since the quantification of the native 2,3,7,8-substituted congeners was based on isotope dilution, the data were automatically corrected for recovery and accurate values were obtained.

A laboratory method blank was prepared and analyzed with the sample batch as part of our routine quality control procedures. The results show the blank to be free of PCDDs and PCDFs at the reporting limits. These results indicate that the sample processing steps did not contribute significantly to the levels reported for the field sample.

A laboratory spike sample was also prepared with the sample batch using clean reference matrix that had been fortified with native standard materials. The results show that the native compounds were recovered at 90-120%. These results were within the target range for the method. Matrix spikes were prepared with the sample batch using sample material from a separate project; results from these analyses will be provided upon request.

The responses obtained for selected labeled congeners in calibration standard analysis U210523B_18 were outside the target range. As specified in our procedures for this method, the averages of the daily response factors for these compounds were used in the calculations for the samples from this runshift. The affected values were flagged "Y" on the results tables. It should be noted that the accuracy of the native congener determinations was not impacted by these deviations.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Minnesota Laboratory Certifications

Authority	Certificate #	Authority	Certificate #
		Missouri	10100
A2LA	2926.01	Montana	CERT0092
Alabama	40770	Nebraska	NE-OS-18-06
Alaska-DW	MN00064	Nevada	MN00064
Alaska-UST	17-009	New Hampshire	2081
Arizona	AZ0014	New Jersey	MN002
Arkansas - WW	88-0680	New York	11647
Arkansas-DW	MN00064	North Carolina-	27700
California	2929	North Carolina-	530
Colorado	MN00064	North Dakota	R-036
Connecticut	PH-0256	Ohio-DW	41244
Florida	E87605	Ohio-VAP (170	CL101
Georgia	959	Ohio-VAP (180	CL110
Hawaii	MN00064	Oklahoma	9507
Idaho	MN00064	Oregon- rimary	MN300001
Illinois	200011	Oregon-Second	MN200001
Indiana	C-MN-01	Pennsylvania	68-00563
Iowa	368	Puerto Rico	MN00064
Kansas	E-10167	South Carolina	74003
Kentucky-DW	90062	Tennessee	TN02818
Kentucky-WW	90062	Texas	T104704192
Louisiana-DEQ	AI-84596	Utah	MN00064
Louisiana-DW	MN00064	Vermont	VT-027053137
Maine	MN00064	Virginia	460163
Maryland	322	Washington	C486
Michigan	9909	West Virginia-D	382
Minnesota	027-053-137	West Virginia-D	9952C
Minnesota-Ag	via MN 027-053	Wisconsin	999407970
Minnesota-Petr	1240	Wyoming-UST	via A2LA 2926.
Mississippi	MN00064		

REPORT OF LABORATORY ANALYSIS

Appendix A

Sample Management

Report No.....10560322_8290FC_DFR

CHAIN-OF-CUSTODY Analytical Request Document

Pace Analytical

Chain-of-Custody is a LEGAL DOCUMENT - Complete all relevent fields

LAB USE ONLY- Affix Workorder Label

ALL SHADE

WO# : 10560322

10560322

Company: Covanta Hpower	Billing Information: Same
Address: 91-174 Hanua Street, Kapolei, HI 96707	
Report To: Katelyn Asato	Email To: kasato@covanta.com
Copy To:	Site Collection Info/Address: 91-174 Hanua Street, Kapolei, HI 96707
Customer Project Name/Number: Q2-2021 RDF Ash Sampling	State: / County/City: Time Zone Collected: [ ]PT [ ]MT [ ]CT [ ]ET
Phone: (808)-426-0852 Email: kasato@covanta.com	Site/Facility ID #: Compliance Monitoring? [ ] Yes [ ] No
Collected By (print): Katelyn Asato	Purchase Order #: Quote #: DW PWS ID #: DW Location Code:
Collected By (signature):	Turnaround Date Required: N/A Immediately Packed on Ice: [ ] Yes [X] No
Sample Disposal: [X] Dispose as appropriate [ ] Return [ ] Archive: _____ [ ] Hold: _____	Rush: [ ] Same Day [ ] Next Day [ ] 2 Day [ ] 3 Day [ ] 4 Day [X] 5 Day (Expedite Charges Apply) Field Filtered (if applicable): [ ] Yes [ ] No Analysis: _____

Container Preservative Type | Lab Project Manager:

** Preservative Types: (1) nitric acid, (2) sulfuric acid, (3) hydrochloric acid, (4) sodium hydroxide, (5) zinc acetate, (6) methanol, (7) sodium bisulfate, (8) sodium thiosulfate, (9) hexane, (A) ascorbic acid, (B) ammonium sulfate, (C) ammonium hydroxide, (D) TSP, (U) Unpreserved, (O) Other _____

* Matrix Codes (Insert in Matrix box below): Drinking Water (DW), Ground Water (GW), Wastewater (WW), Product (P), Soil/Solid (SL), Oil (OL), Wipe (WP), Air (AR), Tissue (TS), Bioassay (B), Vapor (V), Other (OT)

Customer Sample ID	Matrix *	Comp / Grab	Collected (or Composite Start) Date	Collected (or Composite Start) Time	Composite End Date	Composite End Time	Res Cl	# of Ctns	Analyses: Dioxin / Furans 8290T-O with TEQ	Lab Profile/Line:
RDF Q2-2021 Ash Sample	OT	COMP	5-12-21	10:10				1	X	001

Lab Sample Receipt Checklist:
Custody Seals Present/Intact Y N NA
Custody Signatures Present Y N NA
Collector Signature Present Y N NA
Bottles Intact Y N NA
Correct Bottles Y N NA
Sufficient Volume Y N NA
Samples Received on Ice Y N NA
VOA - Headspace Acceptable Y N NA
USDA Regulated Soils Y N NA
Samples in Holding Time Y N NA
Residual Chlorine Present Y N NA
Cl Strips:
Sample pH Acceptable Y N NA
pH Strips: _____
Sulfide Present Y N NA
Lead Acetate Strips: _____

LAB USE ONLY:
Lab Sample # / Comments:

Customer Remarks / Special Conditions / Possible Hazards:

Type of Ice Used: Wet Blue Dry None

Packing Material Used:

Radchem sample(s) screened (<500 cpm): Y N NA

SHORT HOLDS PRESENT (<72 hours): Y N N/A

Lab Tracking #:

Samples received via: * FEDEX UPS Client Courier Pace Courier

LAB Sample Temperature Info:
Temp Blank Received: Y (N) NA
Therm ID#: T3
Cooler 1 Temp Upon Receipt: 21.0C
Cooler 1 Therm Corr. Factor: -0.5C
Cooler 1 Corrected Temp: 20.5oC
Comments:

Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:
	5-12-21 11:00	PACE	5-14-21/17:29
Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:
Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:

MTJL LAB USE ONLY
Table #:
Acctnum:
Template:
Prelogin:
PM:
PB:

Trip Blank Received: Y N NA
HCL MeOH TSP Other

Non Conformance(s): YES / NO

Page: ____ of: ____

Pace Analytical	Document Name: Sample Condition Upon Receipt (SCUR) - MN	Document Revised: 14Apr2021 Page 1 of 1
	Document No.: ENV-FRM-MIN4-0150 Rev.02	Pace Analytical Services- Minneapolis

Sample Condition Upon Receipt

Client Name: Covanta Hennepin

Project #: WO#: 10560322

PM: AW1 Due Date: 06/01/21
CLIENT: COV

Courier: ☐Fed Ex ☒UPS ☐USPS ☐Client ☐Pace ☐SpeeDee ☐Commercial

Tracking Number: 1Z 1VX 683 02 9354 3445 See Exceptions ☐ ENV-FRM-MIN4-0142

Custody Seal on Cooler/Box Present? ☐Yes ☒No **Seals Intact?** ☒Yes ☐No **Biological Tissue Frozen?** ☐Yes ☐No ☒N/A

Packing Material: ☐Bubble Wrap ☐Bubble Bags ☐None ☒Other: Paper **Temp Blank?** ☐Yes ☒No

Thermometer: ☐T1(0461) ☐T2(1336) ☒T3(0459) ☐OS418-LS ☐T4(0254) ☐T5(0489) ☐160285052 **Type of Ice:** ☐Wet ☐Blue ☒None ☐Dry ☐Melted

Did Samples Originate in West Virginia? ☐Yes ☒No **Were All Container Temps Taken?** ☐Yes ☐No ☒N/A

Temp should be above freezing to 6°C **Cooler Temp Read w/temp blank:** 21.0 °C

Correction Factor: -0.5 **Cooler Temp Corrected w/temp blank:** 20.5 °C

Average Corrected Temp (no temp blank only): 20.5 °C ☐See Exceptions ENV-FRM-MIN4-0142 ☒1 Container

USDA Regulated Soil: (☒ N/A, water sample/Other: Ash)

Date/Initials of Person Examining Contents: HB 5/14/21

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA. MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? ☐Yes ☐No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐Yes ☐No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

				COMMENTS:
Chain of Custody Present and Filled Out?	☒Yes	☐No		1.
Chain of Custody Relinquished?	☒Yes	☐No		2.
Sampler Name and/or Signature on COC?	☒Yes	☐No	☐N/A	3.
Samples Arrived within Hold Time?	☒Yes	☐No		4.
Short Hold Time Analysis (<72 hr)?	☐Yes	☒No		5. ☐Fecal Coliform ☐HPC ☐Total Coliform/E coli ☐BOD/cBOD ☐Hex Chrome ☐Turbidity ☐Nitrate ☐Nitrite ☐Orthophos ☐Other
Rush Turn Around Time Requested?	☐Yes	☒No		6.
Sufficient Volume?	☒Yes	☐No		7.
Correct Containers Used?	☒Yes	☐No		8.
-Pace Containers Used?	☐Yes	☒No		
Containers Intact?	☒Yes	☐No		9.
Field Filtered Volume Received for Dissolved Tests?	☐Yes	☐No	☒N/A	10. Is sediment visible in the dissolved container? ☐Yes ☐No
Is sufficient information available to reconcile the samples to the COC?	☒Yes	☐No		11. If no, write ID/ Date/Time on Container Below: See Exception ☐ ENV-FRM-MIN4-0142
Matrix: ☐Water ☐Soil ☐Oil ☒Other Ash				
All containers needing acid/base preservation have been checked?	☐Yes	☐No	☒N/A	12. Sample #
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, <2pH, NaOH >9 Sulfide, NaOH>10 Cyanide)	☐Yes	☐No	☒N/A	☐NaOH ☐HNO_3 ☐H_2SO_4 ☐Zinc Acetate
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin/PFAS	☐Yes	☐No	☒N/A	Positive for Res. Chlorine? ☐Yes ☐No pH Paper Lot# See Exception ☐ ENV-FRM-MIN4-0142
				Res. Chlorine / 0-6 Roll / 0-6 Strip / 0-14 Strip
Extra labels present on soil VOA or WIDRO containers?	☐Yes	☐No	☒N/A	13. See Exception ☐ ENV-FRM-MIN4-0140
Headspace in VOA Vials (greater than 6mm)?	☐Yes	☐No	☒N/A	
Trip Blank Present?	☐Yes	☐No	☒N/A	14. Pace Trip Blank Lot # (if purchased):
Trip Blank Custody Seals Present?	☐Yes	☐No	☒N/A	

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** ☐Yes ☐No

Person Contacted: Date/Time:

Comments/Resolution:

Project Manager Review: Ashley Williams **Date:** 5/17/21

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers).

Report No.....10560322_8290FC_DFR

Labeled by: RNC (2)

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax 612 607 6444

Reporting Flags

A = Reporting Limit based on signal to noise (EDL)

B = Less than 10x higher than method blank level

C = Result obtained from confirmation analysis

D = Result obtained from analysis of diluted sample

E = Exceeds calibration range

I = Interferencepresent

J = Estimated value

L = Suppressive interference, analyte may be biased low

Nn = Value obtained from additional analysis

P = PCDEInterference

R = Recovery outside target range

S = Peak saturated

U = Analyte not detected

V = Result verified by confirmation analysis

X = %D Exceeds limits

Y = Calculated using average of daily RFs

* = SeeDiscussion

REPORT OF LABORATORY ANALYSIS

Appendix B

Sample Analysis Summary

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Pace Analytical™

Method 8290 Sample Analysis Results

Client - Covanta

Client's Sample ID	RDF Q2-2021 Ash Sample		
Lab Sample ID	10560322001		
Filename	U210523B_16		
Injected By	BAL		
Total Amount Extracted	10.0 g	Matrix	Solid
% Moisture	21.4	Dilution	NA
Dry Weight Extracted	7.86 g	Collected	05/12/2021 10:10
ICAL ID	U210423	Received	05/14/2021 17:29
CCal Filename(s)	U210523B_01 & U210523B_18	Extracted	05/18/2021 14:30
Method Blank ID	BLANK-90123	Analyzed	05/23/2021 23:49

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	32	—	1.0	2,3,7,8-TCDF-13C	2.00	79
Total TCDF	930	—	1.0	2,3,7,8-TCDD-13C	2.00	76
				1,2,3,7,8-PeCDF-13C	2.00	80
2,3,7,8-TCDD	7.6	—	1.0	2,3,4,7,8-PeCDF-13C	2.00	80
Total TCDD	200	—	1.0	1,2,3,7,8-PeCDD-13C	2.00	80
				1,2,3,4,7,8-HxCDF-13C	2.00	89
1,2,3,7,8-PeCDF	48	—	5.0	1,2,3,6,7,8-HxCDF-13C	2.00	92
2,3,4,7,8-PeCDF	80	—	5.0	2,3,4,6,7,8-HxCDF-13C	2.00	85
Total PeCDF	990	—	5.0	1,2,3,7,8,9-HxCDF-13C	2.00	72
				1,2,3,4,7,8-HxCDD-13C	2.00	89
1,2,3,7,8-PeCDD	32	—	5.0	1,2,3,6,7,8-HxCDD-13C	2.00	77
Total PeCDD	440	—	5.0	1,2,3,4,6,7,8-HpCDF-13C	2.00	49
				1,2,3,4,7,8,9-HpCDF-13C	2.00	55 Y
1,2,3,4,7,8-HxCDF	92	—	5.0	1,2,3,4,6,7,8-HpCDD-13C	2.00	62 Y
1,2,3,6,7,8-HxCDF	98	—	5.0	OCDD-13C	4.00	49 Y
2,3,4,6,7,8-HxCDF	140	—	5.0			
1,2,3,7,8,9-HxCDF	32	—	5.0	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	960	—	5.0	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	32	—	5.0	2,3,7,8-TCDD-37Cl4	0.20	88
1,2,3,6,7,8-HxCDD	70	—	5.0			
1,2,3,7,8,9-HxCDD	46	—	5.0			
Total HxCDD	860	—	5.0			
1,2,3,4,6,7,8-HpCDF	430	—	5.0	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	58	—	5.0	Equivalence: 130 ng/Kg		
Total HpCDF	490	—	5.0	(Lower-bound - Using 2005 WHO Factors)		
1,2,3,4,6,7,8-HpCDD	460	—	5.0			
Total HpCDD	940	—	5.0			
OCDF	220	—	10			
OCDD	1100	—	10			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
Y = Calculated using average of daily RFs

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Pace Analytical™

Method 8290 Blank Analysis Results

Lab Sample Name	DFBLKCW		
Lab Sample ID	BLANK-90123	Matrix	Solid
Filename	F210521B_07	Dilution	NA
Total Amount Extracted	10.8 g	Extracted	05/18/2021 14:30
ICAL ID	F210425	Analyzed	05/21/2021 20:41
CCal Filename(s)	F210521A_08 & F210522A_06	Injected By	JRH

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	1.0	2,3,7,8-TCDF-13C	2.00	58
Total TCDF	ND	—	1.0	2,3,7,8-TCDD-13C	2.00	61
				1,2,3,7,8-PeCDF-13C	2.00	65
2,3,7,8-TCDD	ND	—	1.0	2,3,4,7,8-PeCDF-13C	2.00	59
Total TCDD	ND	—	1.0	1,2,3,7,8-PeCDD-13C	2.00	76
				1,2,3,4,7,8-HxCDF-13C	2.00	58
1,2,3,7,8-PeCDF	ND	—	5.0	1,2,3,6,7,8-HxCDF-13C	2.00	66
2,3,4,7,8-PeCDF	ND	—	5.0	2,3,4,6,7,8-HxCDF-13C	2.00	60
Total PeCDF	ND	—	5.0	1,2,3,7,8,9-HxCDF-13C	2.00	57
				1,2,3,4,7,8-HxCDD-13C	2.00	62
1,2,3,7,8-PeCDD	ND	—	5.0	1,2,3,6,7,8-HxCDD-13C	2.00	61
Total PeCDD	ND	—	5.0	1,2,3,4,6,7,8-HpCDF-13C	2.00	65
				1,2,3,4,7,8,9-HpCDF-13C	2.00	61
1,2,3,4,7,8-HxCDF	ND	—	5.0	1,2,3,4,6,7,8-HpCDD-13C	2.00	66
1,2,3,6,7,8-HxCDF	ND	—	5.0	OCDD-13C	4.00	55
2,3,4,6,7,8-HxCDF	ND	—	5.0			
1,2,3,7,8,9-HxCDF	ND	—	5.0	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	—	5.0	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	5.0	2,3,7,8-TCDD-37Cl4	0.20	65
1,2,3,6,7,8-HxCDD	ND	—	5.0			
1,2,3,7,8,9-HxCDD	ND	—	5.0			
Total HxCDD	ND	—	5.0			
1,2,3,4,6,7,8-HpCDF	ND	—	5.0	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	5.0	Equivalence: 0.00 ng/Kg		
Total HpCDF	ND	—	5.0	(Lower-bound - Using 2005 WHO Factors)		
1,2,3,4,6,7,8-HpCDD	ND	—	5.0			
Total HpCDD	ND	—	5.0			
OCDF	ND	—	10			
OCDD	ND	—	10			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit

Results reported on a total weight basis and are valid to no more than 2 significant figures.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Pace Analytical™

Method 8290 Laboratory Control Spike Results

Lab Sample ID	LCS-90124		
Filename	F210521B_02	Matrix	Solid
Total Amount Extracted	10.4 g	Dilution	NA
ICAL ID	F210425	Extracted	05/18/2021 14:30
CCal Filename(s)	F210521A_08 & F210522A_06	Analyzed	05/21/2021 16:45
Method Blank ID	BLANK-90123	Injected By	JRH

Native Isomers	Qs (ng)	Qm (ng)	% Rec.
2,3,7,8-TCDF	0.20	0.22	110
Total TCDF			
2,3,7,8-TCDD	0.20	0.21	105
Total TCDD			
1,2,3,7,8-PeCDF	1.0	1.1	109
2,3,4,7,8-PeCDF	1.0	1.1	109
Total PeCDF			
1,2,3,7,8-PeCDD	1.0	0.90	90
Total PeCDD			
1,2,3,4,7,8-HxCDF	1.0	1.2	120
1,2,3,6,7,8-HxCDF	1.0	1.1	112
2,3,4,6,7,8-HxCDF	1.0	1.1	113
1,2,3,7,8,9-HxCDF	1.0	1.1	109
Total HxCDF			
1,2,3,4,7,8-HxCDD	1.0	1.1	111
1,2,3,6,7,8-HxCDD	1.0	1.1	108
1,2,3,7,8,9-HxCDD	1.0	1.1	110
Total HxCDD			
1,2,3,4,6,7,8-HpCDF	1.0	1.1	111
1,2,3,4,7,8,9-HpCDF	1.0	1.1	114
Total HpCDF			
1,2,3,4,6,7,8-HpCDD	1.0	1.1	108
Total HpCDD			
OCDF	2.0	2.1	103
OCDD	2.0	2.0	101

Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF-13C	2.0	60
2,3,7,8-TCDD-13C	2.0	67
1,2,3,7,8-PeCDF-13C	2.0	67
2,3,4,7,8-PeCDF-13C	2.0	67
1,2,3,7,8-PeCDD-13C	2.0	79
1,2,3,4,7,8-HxCDF-13C	2.0	59
1,2,3,6,7,8-HxCDF-13C	2.0	64
2,3,4,6,7,8-HxCDF-13C	2.0	61
1,2,3,7,8,9-HxCDF-13C	2.0	61
1,2,3,4,7,8-HxCDD-13C	2.0	64
1,2,3,6,7,8-HxCDD-13C	2.0	63
1,2,3,4,6,7,8-HpCDF-13C	2.0	66
1,2,3,4,7,8,9-HpCDF-13C	2.0	62
1,2,3,4,6,7,8-HpCDD-13C	2.0	66
OCDD-13C	4.0	47
1,2,3,4-TCDD-13C	2.0	NA
1,2,3,7,8,9-HxCDD-13C	2.0	NA
2,3,7,8-TCDD-37Cl4	0.20	71

Qs = Quantity Spiked
Qm = Quantity Measured
Rec. = Recovery (Expressed as Percent)
R = Recovery outside of target range

Y = RF averaging used in calculations
Nn = Value obtained from additional analysis
NA = Not Applicable
* = See Discussion

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Pace Analytical™

Method 8290 Spiked Sample Report

Client - Covanta

Client's Sample ID	MBN Q2-2021 Ash Sample-MS		
Lab Sample ID	10562480001-MS		
Filename	U210603B_03	Matrix	Solid
Total Amount Extracted	10.2 g	Dilution	NA
ICAL ID	U210423	Extracted	05/28/2021 12:30
CCal Filename(s)	U210603B_01 & U210603B_18	Analyzed	06/03/2021 22:16
Method Blank ID	BLANK-90395	Injected By	SMT

Native Isomers	Qs (ng)	Qm (ng)	% Rec.
2,3,7,8-TCDF	0.20	0.40	199 R
2,3,7,8-TCDD	0.20	0.23	116
1,2,3,7,8-PeCDF	1.00	1.35	135
2,3,4,7,8-PeCDF	1.00	1.30	130
1,2,3,7,8-PeCDD	1.00	1.11	111
1,2,3,4,7,8-HxCDF	1.00	1.34	134
1,2,3,6,7,8-HxCDF	1.00	1.37	137
2,3,4,6,7,8-HxCDF	1.00	1.27	127
1,2,3,7,8,9-HxCDF	1.00	1.13	113
1,2,3,4,7,8-HxCDD	1.00	1.15	115
1,2,3,6,7,8-HxCDD	1.00	1.24	124
1,2,3,7,8,9-HxCDD	1.00	1.11	111
1,2,3,4,6,7,8-HpCDF	1.00	1.63	163 R
1,2,3,4,7,8,9-HpCDF	1.00	1.17	117
1,2,3,4,6,7,8-HpCDD	1.00	1.61	161 R
OCDF	2.00	1.52	76 R
OCDD	2.00	4.12	206 R

Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF-13C	2.00	58
2,3,7,8-TCDD-13C	2.00	35 R
1,2,3,7,8-PeCDF-13C	2.00	76
2,3,4,7,8-PeCDF-13C	2.00	80
1,2,3,7,8-PeCDD-13C	2.00	81
1,2,3,4,7,8-HxCDF-13C	2.00	67
1,2,3,6,7,8-HxCDF-13C	2.00	69
2,3,4,6,7,8-HxCDF-13C	2.00	68
1,2,3,7,8,9-HxCDF-13C	2.00	67
1,2,3,4,7,8-HxCDD-13C	2.00	68
1,2,3,6,7,8-HxCDD-13C	2.00	66
1,2,3,4,6,7,8-HpCDF-13C	2.00	55
1,2,3,4,7,8,9-HpCDF-13C	2.00	39 R
1,2,3,4,6,7,8-HpCDD-13C	2.00	58
OCDD-13C	4.00	47
1,2,3,4-TCDD-13C	2.00	NA
1,2,3,7,8,9-HxCDD-13C	2.00	NA
2,3,7,8-TCDD-37Cl4	0.20	31

Qs = Quantity Spiked Qm = Quantity Measured Rec. = Recovery (Expressed as Percent)

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
R = Recovery outside target range

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 8290 Spiked Sample Report

Client - Covanta

Client's Sample ID	MBN Q2-2021 Ash Sample-MSD		
Lab Sample ID	10562480001-MSD		
Filename	U210603B_04	Matrix	Solid
Total Amount Extracted	10.3 g	Dilution	NA
ICAL ID	U210423	Extracted	05/28/2021 12:30
CCal Filename(s)	U210603B_01 & U210603B_18	Analyzed	06/03/2021 23:00
Method Blank ID	BLANK-90395	Injected By	SMT

Native Isomers	Qs (ng)	Qm (ng)	% Rec.
2,3,7,8-TCDF	0.20	0.65	323
2,3,7,8-TCDD	0.20	0.20	102
1,2,3,7,8-PeCDF	1.00	1.70	170
2,3,4,7,8-PeCDF	1.00	1.48	148
1,2,3,7,8-PeCDD	1.00	1.24	124
1,2,3,4,7,8-HxCDF	1.00	1.71	171
1,2,3,6,7,8-HxCDF	1.00	1.55	155
2,3,4,6,7,8-HxCDF	1.00	1.48	148
1,2,3,7,8,9-HxCDF	1.00	1.22	122
1,2,3,4,7,8-HxCDD	1.00	1.23	123
1,2,3,6,7,8-HxCDD	1.00	1.33	133
1,2,3,7,8,9-HxCDD	1.00	1.18	118
1,2,3,4,6,7,8-HpCDF	1.00	2.32	232
1,2,3,4,7,8,9-HpCDF	1.00	1.22	122
1,2,3,4,6,7,8-HpCDD	1.00	2.12	212
OCDF	2.00	2.31	116
OCDD	2.00	5.49	275

Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF-13C	2.00	66
2,3,7,8-TCDD-13C	2.00	44
1,2,3,7,8-PeCDF-13C	2.00	84
2,3,4,7,8-PeCDF-13C	2.00	88
1,2,3,7,8-PeCDD-13C	2.00	93
1,2,3,4,7,8-HxCDF-13C	2.00	73
1,2,3,6,7,8-HxCDF-13C	2.00	78
2,3,4,6,7,8-HxCDF-13C	2.00	75
1,2,3,7,8,9-HxCDF-13C	2.00	73
1,2,3,4,7,8-HxCDD-13C	2.00	77
1,2,3,6,7,8-HxCDD-13C	2.00	74
1,2,3,4,6,7,8-HpCDF-13C	2.00	59
1,2,3,4,7,8,9-HpCDF-13C	2.00	38 R
1,2,3,4,6,7,8-HpCDD-13C	2.00	62
OCDD-13C	4.00	55
1,2,3,4-TCDD-13C	2.00	NA
1,2,3,7,8,9-HxCDD-13C	2.00	NA
2,3,7,8-TCDD-37Cl4	0.20	39

Qs = Quantity Spiked Qm = Quantity Measured Rec. = Recovery (Expressed as Percent)

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
R = Recovery outside target range

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Pace Analytical™

Method 8290 Spike Sample Results

Client - Covanta

Client Sample ID	MBN Q2-2021 Ash Sample			Dry Weights	
Lab Sample ID	10562480001	Sample Filename	U210603B_16	Sample Amount	8.41 g
MS ID	10562480001-MS	MS Filename	U210603B_03	MS Amount	8.4 g
MSD ID	10562480001-MSD	MSD Filename	U210603B_04	MSD Amount	8.5 g

Analyte	Sample Qm (ng)	MS/MSD Qs (ng)	MS Qm (ng)	MSD Qm (ng)	RPD	Background Subtracted MS % Rec.	Background Subtracted MSD % Rec.	Background Subtracted RPD
2,3,7,8-TCDF	0.45	0.20	0.40	0.65	47.5	0	98	200.0
2,3,7,8-TCDD	0.00	0.20	0.23	0.20	12.3	116	102	12.3
1,2,3,7,8-PeCDF	0.66	1.00	1.35	1.70	22.9	70	105	40.2
2,3,4,7,8-PeCDF	0.51	1.00	1.30	1.48	13.4	79	98	21.0
1,2,3,7,8-PeCDD	0.21	1.00	1.11	1.24	10.9	90	103	13.3
1,2,3,4,7,8-HxCDF	0.52	1.00	1.34	1.71	23.7	82	118	36.1
1,2,3,6,7,8-HxCDF	0.55	1.00	1.37	1.55	12.1	82	100	19.3
2,3,4,6,7,8-HxCDF	0.38	1.00	1.27	1.48	15.1	89	109	20.9
1,2,3,7,8,9-HxCDF	0.11	1.00	1.13	1.22	7.5	103	111	8.2
1,2,3,4,7,8-HxCDD	0.10	1.00	1.15	1.23	6.2	105	113	6.7
1,2,3,6,7,8-HxCDD	0.16	1.00	1.24	1.33	7.3	107	117	8.3
1,2,3,7,8,9-HxCDD	0.13	1.00	1.11	1.18	5.9	98	105	6.7
1,2,3,4,6,7,8-HpCDF	1.15	1.00	1.63	2.32	34.6	48	116	83.2
1,2,3,4,7,8,9-HpCDF	0.13	1.00	1.17	1.22	4.2	104	109	4.7
1,2,3,4,6,7,8-HpCDD	1.01	1.00	1.61	2.12	26.9	60	110	58.9
OCDF	0.43	2.00	1.52	2.31	41.6	54	94	53.7
OCDD	3.35	2.00	4.12	5.49	28.6	39	107	94.2

Definitions

MS = Matrix Spike
MSD = Matrix Spike Duplicate
Qm = Quantity Measured
Qs = Quantity Spiked
% Rec. = Percent Recovery
RPD = Relative Percent Difference
NA = Not Applicable
NC = Not Calculated

CDD = Chlorinated dibenzo-p-dioxin
CDF = Chlorinated dibenzo-p-furan
T = Tetra
Pe = Penta
Hx = Hexa
Hp = Hepta
O = Octa

COVANTA HONOLULU RESOURCE RECOVERY VENTURE

Unit 3

2nd Quarter 2021 Ash Characterization Results

COVANTA INC.
ENVIRONMENTAL DEPARTMENT

ENVIRONMENTAL TEST REPORT
FOR
HONOLULU RESOURCE RECOVERY VENTURE'S H-POWER UNIT 3

CEG REPORT NO.:	4515
REPORT DATE:	June 16, 2021
PREPARED FOR:	Honolulu Resources Recovery Venture H-Power
PURPOSE:	Characterization of Ash Residue from Unit 3
SAMPLE PERIOD:	April 2021
ASSOCIATED REPORTS:	Sampling Protocol Dated July 31, 1990 And EPA'S Final Guidance
PREPARED BY:	Covanta, Inc. Environmental Department

COMBINED ASH RESIDUE CHARACTERIZATION REPORT
FOR
HONOLULU RESOURCE RECOVERY VENTURE'S H-POWER UNIT 3

TABLE OF CONTENTS

1.0 INTRODUCTION

A combined ash residue characterization program was implemented for mass burn combustion Unit 3 at the H-Power Municipal Waste Combustor Facility located in Honolulu, Hawaii. The program was designed to be consistent with the Hawaii Department of Health's Solid Waste Management requirements for the management of ash residue from municipal waste incineration regulations. The sampling program was designed, conducted and consistent in accordance with the Combined Ash Sampling Protocol CHRRV Unit 3 Modification submitted August 12, 2016 to the State of Hawaii, Department of Health. This interim procedure was approved by the State of Hawaii, Department of Health. The modified program was designed to incorporate the analytical procedures in EPA's May 24, 1994 draft guidance document, "Sampling and Analysis of Municipal Refuse Incinerator Ash" [1] and its supporting document, "Test Methods for Evaluating Solid Waste" (SW-846).[2] The analytical program is consistent with the EPA's final guidance on ash sampling.[3] The ash samples were evaluated in accordance with the procedures set forth by the U.S. EPA Toxicity Characteristic Leaching Procedure (TCLP), Method 1311, as described in 40 CFR 261, Appendix II.

2.0 FIELD ASH SAMPLING PROCEDURES

Field sampling of the combined ash was performed by representatives of the facility at a location consistent with the designated sampling site in the approved sampling protocol and where representative samples could be safely obtained. Ten ash samples were collected during April 2021. The sample dates and associated sample labels for the ten samples ultimately analyzed are identified in Table 1.

3.0 LABORATORY INFORMATION

One subsample was generated from the ten individual composite ash samples that were collected during the ash characterization. This one composite sample was delivered to the Pace Analytical Services, LLC. laboratory for dioxin and furan analysis. The ten individual composite samples collected for TCLP metals determination were delivered to Element One Inc. for sample preparation and TCLP analysis for the eight RCRA metals as determined by EPA Method 1311. Both Element One Inc. and Pace Analytical Services, LLC. are NELAP and a NELAC accredited laboratories in several US States.

4.0 ASH SUBSAMPLE PREPARATION

When received at analytical lab Element One Inc., the ten ash samples were weighed

and screened through a 0.375" sieve to determine percent of material, plus and minus the sieve size and to do additional crushing as necessary. In addition to analyzing each sample for TCLP for the RCRA metals, an additional subsample from each of the ten ash samples was taken to determine the moisture content, percent volatile solids, laboratory pH, total RCRA metals and total hexavalent chromium.

Table 1 presents the laboratory preparation weights of the individual samples and the moisture results. The laboratory data used to develop Table 1 is provided in Appendix A.

5.0 ANALYTICAL PROCEDURES

The Toxicity Characteristic Leaching Procedure (TCLP) was performed in accordance with Method 1311 as detailed in the Environmental Protection Agency Manual SW-846 - Test Methods for Evaluating Solid Waste - Physical/Chemical Methods.

6.0 DATA ANALYSIS

6.1 ANALYTICAL RESULTS

The laboratory analytical results are presented as Appendices A and B of this report. The laboratory analytical data presented as Appendix A have been evaluated in accordance with the procedures in SW-846, Chapter 9. The quality assurance and quality control results are also submitted in Appendix A and Appendix B.

6.2 STATISTICAL RESULTS

The statistical results for metals are presented in Table 2. Laboratory results below the detection limit are presented in Table 2 as the laboratory detection limit.

Table 3 presents a comparison of the Regulatory Threshold for each metal analyte and the relevant SW-846 statistical value for determining whether a waste material exhibits a toxic characteristic.

6.3 DIOXIN AND FURAN ANALYSIS

The results of the single composite combined ash sample for dioxins and furans are attached as Appendix B. The total 2,3,7,8-TCDD Equivalence was 77 ng/Kg or ppt. The total tetrachlorinated dibenzo-dioxins (TCDD) and furans (TCDF) are expressed in units of parts per trillion (ppt). The wet results represent 17.6% moisture content as determined by the 10.2-gram sample analyzed by Pace Analytical Services, LLC. The

pertinent information from this laboratory report is as follows:

Analyses Reference	Analyte	Dry Results (ppt)	Wet Results (ppt)
DB-5/ DB-225	Total TCDD	200	165
DB-5/ DB-225	Total TCDF	1500	1236

6.4 TOTAL METALS AND HEXAVALENT CHROMIUM

Total and TCLP metals (arsenic, barium, cadmium, chromium, lead, selenium and silver) were analyzed for each of the ten samples using the analytical procedure 6020B. Total mercury was analyzed using procedure 7470A and TCLP mercury was analyzed using procedure 7470A.The procedure used for hexavalent chromium was 3060A.

7.0 CONCLUSION

All analytical data was evaluated in complete compliance with the procedures set forth and required by SW-846. The composite analytical evaluation and the statistical evaluation have determined that the ash does not exhibit a hazardous characteristic and that it should be managed as a non-hazardous solid waste.

8.0 REFERENCES

(1) Environmental Protection Agency,
"Sampling and Analysis of Municipal Refuse Incinerator Ash," (Draft Guidance Document) May 1994.

(2) Environmental Protection Agency,
"Manual SW-846 - Test Methods for Evaluating Solid Waste - Physical/Chemical Methods," March 1992.

(3) Environmental Protection Agency,
"Guidance for the Sampling and Analysis of Municipal Waste Combustion Ash for the Toxicity Characteristic," June 1995

Table 1

FIELD ASH SAMPLE SCHEDULE AND BULK CHARACTERISTICS

		Composite Subsample Bulk Characteristics (Kilograms)			
Sample	Date	Greater than 3/8 Inches and Non-Crushable Metals	Less than 3/8 Inches	Total	Moisture (As Wt. %)
36460-1	4/14/2021	0.00	0.10	0.10	17.1
36460-2	4/14/2021	0.00	0.09	0.09	16.7
36460-3	4/15/2021	0.00	0.10	0.10	22.4
36460-4	4/16/2021	0.00	0.10	0.10	21.7
36460-5	4/16/2021	0.00	0.10	0.10	22.4
36460-6	4/16/2021	0.00	0.10	0.10	24.2
36460-7	4/17/2021	0.00	0.10	0.10	15.8
36460-8	4/18/2021	0.00	0.10	0.10	21.9
36460-9	4/19/2021	0.00	0.10	0.10	17.5
36460-10	4/19/2021	0.00	0.10	0.10	18.2

TABLE 2.0 LABORATORY RESULTS FOR THE COVANTA HONOLULU INC.-UNIT 3 FACILITY

2.1 SAMPLE SPECIFIC RESULTS

Sample Number	Date of Composite	Concentration Levels (mg/l) Arsenic (As)	Barium (Ba)	Cadmium (Cd)	Chromium (Cr)	Lead (Pb)	Mercury (Hg)	Selenium (Se)	Silver (Ag)
36737-1	4/14/2021	0.05	0.702	0.05	0.05	0.05	0.0004	0.05	0.05
36737-2	4/14/2021	0.05	0.794	0.05	0.05	0.05	0.0004	0.05	0.05
36737-3	4/15/2021	0.05	0.767	0.05	0.05	0.05	0.0004	0.05	0.05
36737-4	4/16/2021	0.05	0.837	0.05	0.05	0.05	0.0004	0.072	0.05
36737-5	4/16/2021	0.05	0.662	0.057	0.05	0.05	0.0004	0.05	0.05
36737-6	4/16/2021	0.05	1.780	0.05	0.05	0.05	0.0004	0.05	0.05
36737-7	4/17/2021	0.05	0.710	0.05	0.05	0.05	0.0004	0.05	0.05
36737-8	4/18/2021	0.05	0.791	0.115	0.05	0.05	0.0004	0.05	0.05
36737-9	4/19/2021	0.05	0.746	0.05	0.05	0.05	0.0004	0.05	0.05
36737-10	4/19/2021	0.05	0.851	0.05	0.05	0.05	0.0004	0.05	0.05
2.2 Statistical Analysis									
Regulatory Threshold		5.0	100.0	1.0	5.0	5.0	0.20	1.0	5.0
Number of Samples		10	10	10	10	10	10	10	10
Sum of the Concentrations		0.50	8.64	0.57	0.50	0.50	0.004	0.52	0.50
(Sum of the Concentrations)^2		0.25	74.65	0.33	0.25	0.25	0.000016	0.27	0.25
Sum of the Squares of the Concentrations		0.03	8.43	0.04	0.03	0.03	0.0000016	0.03	0.03
Student "T" Constant (two tailed confidence interval @ 80%, t.20)		1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38
Mean, x		0.05	0.864	0.06	0.00	0.05	0.0004	0.05	0.05
Variance, s^2		0.00	0.107	0.000	0.00	0.00	0.00	0.0000	0.00
Standard Deviation, s		0.00	0.327	0.02	0.00	0.00	0.00	0.01	0.00
Standard Error, s_x		0.00	0.104	0.006	0.00	0.00	0.00	0.002	0.00
Upper Confidence Interval (normal)		0.05	1.007	0.07	0.05	0.05	0.0004	0.06	0.05

Table 3

COMPARISON OF SW-846 STATISTICAL RESULTS
AND REGULATORY THRESHOLDS
FOR METAL ANALYTES

Analyte	90% Upper Confidence Interval per SW-846 (b)	Regulatory Threshold (a)
Metals		
Arsenic	0.05	5.0
Barium	1.007	100.0
Cadmium	0.07	1.0
Chromium	0.05	5.0
Lead	0.05	5.0
Mercury	0.0004	0.2
Selenium	0.06	1.0
Silver	0.05	5.0

(a) 40 CFR Part 261. All units are expressed as milligrams per liter (mg/L).

(b) 90% Upper Confidence Interval as a single-tailed distribution is equivalent to an 80% Upper Confidence Interval as a two-tailed distribution.

APPENDIX A
Element One Inc.
Laboratory and QA/QC Results

Element One Inc.
6319-D Carolina Beach Rd.
Wilmington, NC 28412

Phone: 910 793-0128
Fax: 910 792-6853
e1lab@e1lab.com

elementOne

SUMMARY OF TCLP ANALYSES
Element One, Inc. Project Number e36737

Covanta Honolulu, Inc.
91-174 Hanua Street
Kapolei, HI 96707

June 2, 2021
Client Project Name 2Q21 Unit 3 Ash Sampling
Client Project Number

Sample ID: HON/CA/04-14-21/02:30/U3/1a

Sample Matrix	Combined Ash	Sample Type	Truck	Date Received	05/21/2021
Date Combined	04/14/2021	Time Sampled	0230	Time Received	0955
Sampler		Delivered by	UPS	Received by	LLB
Extraction Begun	05/23/21 1500	Extraction Ended	05/24/21 0840	E1 Sample #	36737-1

Parameter	Result	Unit	Calc. RL	Dilution	DL	Method	Date
Chromium, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/25/21
Arsenic, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/25/21
Selenium, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/25/21
Silver, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/25/21
Cadmium, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/25/21
Barium, TCLP digested	0.702	mg/L	0.05	50	0.001	EPA 1311/6020B	05/25/21
Lead, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/25/21
Mercury, TCLP digested	< 0.0004	mg/L	0.0004	2	0.0002	EPA 1311/7470A	05/25/21
Solids	82.9	%				SM2540G	05/23/21
pH, Initial	12.76	SU				EPA 1311	05/23/21
Fluid Determination pH	11.67	SU				EPA 1311	05/23/21
TCLP pH, Final	10.18	SU				EPA 1311	05/24/21
pH, Extraction Fluid #2	2.86	SU				EPA 1311	05/23/21

Ken Smith, Laboratory Director

36737 Covanta Honolulu Quarterly Report 1-10 Compiled by DAM|KMB

Certifications: NJ NELAP NC009, NY ELAP 11689 and NC DWQ DENR 604

elementOne

Element One Inc.
6319-D Carolina Beach Rd.
Wilmington, NC 28412

Phone: 910 793-0128
Fax: 910 792-6853
e1lab@e1lab.com

SUMMARY OF TOTAL ANALYSES
Element One, Inc. Project Number e36737

Covanta Honolulu, Inc.
91-174 Hanua Street
Kapolei, HI 96707

June 2, 2021
Client Project Name 2Q21 Unit 3 Ash Sampling
Client Project Number

Sample ID: HON/CA/04-14-21/02:30/U3/1a

Sample Matrix	Combined Ash	Sample Type	Truck	Date Received	05/21/2021
Date Combined	04/14/2021	Time Sampled	0230	Time Received	0955
Sampler		Delivered by	UPS	Received by	LLB
				E1 Sample #	36737-1 TOT

Parameter	Result As Received	Result Dry Basis	Unit	Dilution	DL	Method	Date
Chromium, Total	1097	1323	mg/kg	500	0.1	EPA 3051/6020B	06/01/21
Arsenic, Total	78.1	94.2	mg/kg	25	0.1	EPA 3051/6020B	06/01/21
Selenium, Total	5.99	7.23	mg/kg	25	0.1	EPA 3051/6020B	06/01/21
Silver, Total	13.5	16.3	mg/kg	25	0.1	EPA 3051/6020B	06/01/21
Cadmium, Total	73.6	88.8	mg/kg	25	0.1	EPA 3051/6020B	06/01/21
Barium, Total	364	439	mg/kg	25	0.1	EPA 3051/6020B	06/01/21
Lead, Total	1455	1755	mg/kg	500	0.1	EPA 3051/6020B	06/01/21
Mercury, Total	0.991	1.20	mg/kg	2	0.2	EPA 3051/7470A	06/01/21
Hexavalent Chromium, Total	1.75	2.11	mg/kg	10	0.010	EPA 3060A	06/01/21
Total Volatile Residue	6.35		%			SM2540G/E	05/25/21
pH, as received	11.99		SU			EPA 9045D	05/25/21
Solids	82.9		%			SM2540G	05/23/21
Moisture	17.1		%			SM2540G	05/23/21

Ken Smith, Laboratory Director

el1

elementOne

Element One Inc.
6319-D Carolina Beach Rd.
Wilmington, NC 28412

Phone: 910 793-0128
Fax: 910 792-6853
e1lab@e1lab.com

SUMMARY OF TCLP ANALYSES
Element One, Inc. Project Number e36737

Covanta Honolulu, Inc.
91-174 Hanua Street
Kapolei, HI 96707

June 2, 2021
Client Project Name 2Q21 Unit 3 Ash Sampling
Client Project Number

Sample ID: HON/CA/04-14-21/22:00/U3/2b

Sample Matrix	Combined Ash	Sample Type	Truck	Date Received	05/21/2021
Date Combined	04/14/2021	Time Sampled	2200	Time Received	0955
Sampler		Delivered by	UPS	Received by	LLB
Extraction Begun	05/23/21 1500	Extraction Ended	05/24/21 0840	E1 Sample #	36737-2

Parameter	Result	Unit	Calc. RL	Dilution	DL	Method	Date
Chromium, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/25/21
Arsenic, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/25/21
Selenium, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/25/21
Silver, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/25/21
Cadmium, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/25/21
Barium, TCLP digested	0.794	mg/L	0.05	50	0.001	EPA 1311/6020B	05/25/21
Lead, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/25/21
Mercury, TCLP digested	< 0.0004	mg/L	0.0004	2	0.0002	EPA 1311/7470A	05/25/21
Solids	83.3	%				SM2540G	05/23/21
pH, Initial	12.77	SU				EPA 1311	05/23/21
Fluid Determination pH	11.06	SU				EPA 1311	05/23/21
TCLP pH, Final	9.59	SU				EPA 1311	05/24/21
pH, Extraction Fluid #2	2.86	SU				EPA 1311	05/23/21

Ken Smith, Laboratory Director

Element One Inc.
6319-D Carolina Beach Rd.
Wilmington, NC 28412

Phone: 910 793-0128
Fax: 910 792-6853
e1lab@e1lab.com

elementOne

SUMMARY OF TOTAL ANALYSES
Element One, Inc. Project Number e36737

Covanta Honolulu, Inc.
91-174 Hanua Street
Kapolei, HI 96707

June 2, 2021
Client Project Name 2Q21 Unit 3 Ash Sampling
Client Project Number

Sample ID: HON/CA/04-14-21/22:00/U3/2b

Sample Matrix	Combined Ash	Sample Type	Truck	Date Received	05/21/2021
Date Combined	04/14/2021	Time Sampled	2200	Time Received	0955
Sampler		Delivered by	UPS	Received by	LLB
				E1 Sample #	36737-2 TOT

Parameter	Result As Received	Result Dry Basis	Unit	Dilution	DL	Method	Date
Chromium, Total	79.6	95.6	mg/kg	25	0.1	EPA 3051/6020B	06/01/21
Arsenic, Total	95.8	115	mg/kg	25	0.1	EPA 3051/6020B	06/01/21
Selenium, Total	12.6	15.1	mg/kg	25	0.1	EPA 3051/6020B	06/01/21
Silver, Total	15.7	18.8	mg/kg	25	0.1	EPA 3051/6020B	06/01/21
Cadmium, Total	91.3	110	mg/kg	25	0.1	EPA 3051/6020B	06/01/21
Barium, Total	400	480	mg/kg	25	0.1	EPA 3051/6020B	06/01/21
Lead, Total	1714	2058	mg/kg	500	0.1	EPA 3051/6020B	06/01/21
Mercury, Total	1.38	1.66	mg/kg	2	0.2	EPA 3051/7470A	06/01/21
Hexavalent Chromium, Total	1.33	1.60	mg/kg	10	0.010	EPA 3060A	06/01/21
Total Volatile Residue	7.01		%			SM2540G/E	05/25/21
pH, as received	12.05		SU			EPA 9045D	05/25/21
Solids	83.3		%			SM2540G	05/23/21
Moisture	16.7		%			SM2540G	05/23/21

Ken Smith, Laboratory Director

36737 Covanta Honolulu Quarterly Report 1-10 Compiled by DAM/CAH

Certifications: NJ NELAP NC009, NY ELAP 11889 and NC DWQ DENR 604

Element One Inc.
6319-D Carolina Beach Rd.
Wilmington, NC 28412

Phone: 910 793-0128
Fax: 910 792-6853
e1lab@e1lab.com

elementOne

SUMMARY OF TCLP ANALYSES
Element One, Inc. Project Number e36737

Covanta Honolulu, Inc.
91-174 Hanua Street
Kapolei, HI 96707

June 2, 2021
Client Project Name 2Q21 Unit 3 Ash Sampling
Client Project Number

Sample ID: HON/CA/04-15-21/23:48/U3/3c

Sample Matrix	Combined Ash	Sample Type	Truck	Date Received	05/21/2021
Date Combined	04/15/2021	Time Sampled	2348	Time Received	0955
Sampler		Delivered by	UPS	Received by	LLB
Extraction Begun	05/23/21 1500	Extraction Ended	05/24/21 0840	E1 Sample #	36737-3

Parameter	Result	Unit	Calc. RL	Dilution	DL	Method	Date
Chromium, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/25/21
Arsenic, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/25/21
Selenium, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/25/21
Silver, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/25/21
Cadmium, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/25/21
Barium, TCLP digested	0.767	mg/L	0.05	50	0.001	EPA 1311/6020B	05/25/21
Lead, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/25/21
Mercury, TCLP digested	< 0.0004	mg/L	0.0004	2	0.0002	EPA 1311/7470A	05/25/21
Solids	77.6	%				SM2540G	05/23/21
pH, Initial	12.76	SU				EPA 1311	05/23/21
Fluid Determination pH	10.86	SU				EPA 1311	05/23/21
TCLP pH, Final	9.42	SU				EPA 1311	05/24/21
pH, Extraction Fluid #2	2.86	SU				EPA 1311	05/23/21

Ken Smith, Laboratory Director

Certifications: NJ NELAP NC009, NY ELAP 11889 and NC DWQ DENR 604

elementOne

Element One Inc.
6319-D Carolina Beach Rd.
Wilmington, NC 28412

Phone: 910 793-0128
Fax: 910 792-6853
e1lab@e1lab.com

SUMMARY OF TOTAL ANALYSES
Element One, Inc. Project Number e36737

Covanta Honolulu, Inc.
91-174 Hanua Street
Kapolei, HI 96707

June 2, 2021
Client Project Name 2Q21 Unit 3 Ash Sampling
Client Project Number

Sample ID: HON/CA/04-15-21/23:48/U3/3c

Sample Matrix	Combined Ash	Sample Type	Truck	Date Received	05/21/2021
Date Combined	04/15/2021	Time Sampled	2348	Time Received	0955
Sampler		Delivered by	UPS	Received by	LLB
				E1 Sample #	36737-3 TOT

Parameter	Result As Received	Result Dry Basis	Unit	Dilution	DL	Method	Date
Chromium, Total	91.0	117	mg/kg	25	0.1	EPA 3051/6020B	06/01/21
Arsenic, Total	137	177	mg/kg	25	0.1	EPA 3051/6020B	06/01/21
Selenium, Total	18.6	24.0	mg/kg	25	0.1	EPA 3051/6020B	06/01/21
Silver, Total	10.6	13.7	mg/kg	25	0.1	EPA 3051/6020B	06/01/21
Cadmium, Total	83.1	107	mg/kg	25	0.1	EPA 3051/6020B	06/01/21
Barium, Total	417	537	mg/kg	25	0.1	EPA 3051/6020B	06/01/21
Lead, Total	2183	2813	mg/kg	500	0.1	EPA 3051/6020B	06/01/21
Mercury, Total	1.47	1.89	mg/kg	2	0.2	EPA 3051/7470A	06/01/21
Hexavalent Chromium, Total	0.433	0.558	mg/kg	10	0.010	EPA 3060A	06/01/21
Total Volatile Residue	4.41		%			SM2540G/E	05/25/21
pH, as received	12.01		SU			EPA 9045D	05/25/21
Solids	77.6		%			SM2540G	05/23/21
Moisture	22.4		%			SM2540G	05/23/21

Ken Smith, Laboratory Director

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Certifications: NJ NELAP NC009, NY ELAP 11889 and NC DWQ DENR 604

Element One Inc.
6319-D Carolina Beach Rd.
Wilmington, NC 28412

Phone: 910 793-0128
Fax: 910 792-6853
e1lab@e1lab.com

elementOne

SUMMARY OF TCLP ANALYSES
Element One, Inc. Project Number e36737

Covanta Honolulu, Inc.
91-174 Hanua Street
Kapolei, HI 96707

June 2, 2021
Client Project Name 2Q21 Unit 3 Ash Sampling
Client Project Number

Sample ID: HON/CA/04-16-21/06:00/U3/4a

Sample Matrix	Combined Ash	Sample Type	Truck	Date Received	05/21/2021
Date Combined	04/16/2021	Time Sampled	0600	Time Received	0955
Sampler		Delivered by	UPS	Received by	LLB
Extraction Begun	05/23/21 1500	Extraction Ended	05/24/21 0840	E1 Sample #	36737-4

Parameter	Result	Unit	Calc. RL	Dilution	DL	Method	Date
Chromium, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/25/21
Arsenic, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/25/21
Selenium, TCLP digested	0.072	mg/L	0.05	50	0.001	EPA 1311/6020B	05/25/21
Silver, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/25/21
Cadmium, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/25/21
Barium, TCLP digested	0.837	mg/L	0.05	50	0.001	EPA 1311/6020B	05/25/21
Lead, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/25/21
Mercury, TCLP digested	< 0.0004	mg/L	0.0004	2	0.0002	EPA 1311/7470A	05/25/21
Solids	78.3	%				SM2540G	05/23/21
pH, Initial	12.96	SU				EPA 1311	05/23/21
Fluid Determination pH	11.22	SU				EPA 1311	05/23/21
TCLP pH, Final	9.83	SU				EPA 1311	05/24/21
pH, Extraction Fluid #2	2.86	SU				EPA 1311	05/23/21

Ken Smith, Laboratory Director

el1

elementOne

Element One Inc.
6319-D Carolina Beach Rd.
Wilmington, NC 28412

Phone: 910 793-0128
Fax: 910 792-6853
e1lab@e1lab.com

SUMMARY OF TOTAL ANALYSES
Element One, Inc. Project Number e36737

Covanta Honolulu, Inc.
91-174 Hanua Street
Kapolei, HI 96707

June 2, 2021
Client Project Name 2Q21 Unit 3 Ash Sampling
Client Project Number

Sample ID: HON/CA/04-16-21/06:00/U3/4a

Sample Matrix	Combined Ash	Sample Type	Truck	Date Received	05/21/2021
Date Combined	04/16/2021	Time Sampled	0600	Time Received	0955
Sampler		Delivered by	UPS	Received by	LLB
				E1 Sample #	36737-4 TOT

Parameter	Result As Received	Result Dry Basis	Unit	Dilution	DL	Method	Date
Chromium, Total	57.9	73.9	mg/kg	25	0.1	EPA 3051/6020B	06/01/21
Arsenic, Total	99.1	127	mg/kg	25	0.1	EPA 3051/6020B	06/01/21
Selenium, Total	3.99	5.10	mg/kg	25	0.1	EPA 3051/6020B	06/01/21
Silver, Total	6.40	8.17	mg/kg	25	0.1	EPA 3051/6020B	06/01/21
Cadmium, Total	58.4	74.6	mg/kg	25	0.1	EPA 3051/6020B	06/01/21
Barium, Total	427	545	mg/kg	25	0.1	EPA 3051/6020B	06/01/21
Lead, Total	2039	2604	mg/kg	500	0.1	EPA 3051/6020B	06/01/21
Mercury, Total	1.04	1.33	mg/kg	2	0.2	EPA 3051/7470A	06/01/21
Hexavalent Chromium, Total	1.19	1.52	mg/kg	10	0.010	EPA 3060A	06/01/21
Total Volatile Residue	5.20		%			SM2540G/E	05/25/21
pH, as received	12.14		SU			EPA 9045D	05/25/21
Solids	78.3		%			SM2540G	05/23/21
Moisture	21.7		%			SM2540G	05/23/21

Ken Smith, Laboratory Director

Element One Inc.
6319-D Carolina Beach Rd.
Wilmington, NC 28412

Phone: 910 793-0128
Fax: 910 792-6853
e1lab@e1lab.com

elementOne

SUMMARY OF TCLP ANALYSES
Element One, Inc. Project Number e36737

Covanta Honolulu, Inc.
91-174 Hanua Street
Kapolei, HI 96707

June 2, 2021
Client Project Name 2Q21 Unit 3 Ash Sampling
Client Project Number

Sample ID: HON/CA/04-16-21/08:30/U3/5b

Sample Matrix	Combined Ash	Sample Type	Truck	Date Received	05/21/2021
Date Combined	04/16/2021	Time Sampled	0830	Time Received	0955
Sampler		Delivered by	UPS	Received by	LLB
Extraction Begun	05/23/21 1500	Extraction Ended	05/24/21 0840	E1 Sample #	36737-5

Parameter	Result	Unit	Calc. RL	Dilution	DL	Method	Date
Chromium, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/25/21
Arsenic, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/25/21
Selenium, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/25/21
Silver, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/25/21
Cadmium, TCLP digested	0.057	mg/L	0.05	50	0.001	EPA 1311/6020B	05/25/21
Barium, TCLP digested	0.662	mg/L	0.05	50	0.001	EPA 1311/6020B	05/25/21
Lead, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/25/21
Mercury, TCLP digested	< 0.0004	mg/L	0.0004	2	0.0002	EPA 1311/7470A	05/25/21
Solids	77.6	%				SM2540G	05/23/21
pH, Initial	12.80	SU				EPA 1311	05/23/21
Fluid Determination pH	10.80	SU				EPA 1311	05/23/21
TCLP pH, Final	8.74	SU				EPA 1311	05/24/21
pH, Extraction Fluid #2	2.86	SU				EPA 1311	05/23/21

Ken Smith, Laboratory Director

36737 Covanta Honolulu Quarterly Report 1-10 Compiled by DMM/CWH

Certifications: NJ NELAP NC009, NY ELAP 11889 and NC DWQ DENR 604

elementOne

Element One Inc.
6319-D Carolina Beach Rd.
Wilmington, NC 28412

Phone: 910 793-0128
Fax: 910 792-6853
e1lab@e1lab.com

SUMMARY OF TOTAL ANALYSES
Element One, Inc. Project Number e36737

Covanta Honolulu, Inc.
91-174 Hanua Street
Kapolei, HI 96707

June 2, 2021
Client Project Name 2Q21 Unit 3 Ash Sampling
Client Project Number

Sample ID: HON/CA/04-16-21/08:30/U3/5b

Sample Matrix	Combined Ash	Sample Type	Truck	Date Received	05/21/2021
Date Combined	04/16/2021	Time Sampled	0830	Time Received	0955
Sampler		Delivered by	UPS	Received by	LLB
				E1 Sample #	36737-5 TOT

Parameter	Result As Received	Result Dry Basis	Unit	Dilution	DL	Method	Date
Chromium, Total	92.5	119	mg/kg	25	0.1	EPA 3051/6020B	06/01/21
Arsenic, Total	101	130	mg/kg	25	0.1	EPA 3051/6020B	06/01/21
Selenium, Total	12.7	16.4	mg/kg	25	0.1	EPA 3051/6020B	06/01/21
Silver, Total	12.3	15.9	mg/kg	25	0.1	EPA 3051/6020B	06/01/21
Cadmium, Total	77.9	100	mg/kg	25	0.1	EPA 3051/6020B	06/01/21
Barium, Total	462	595	mg/kg	25	0.1	EPA 3051/6020B	06/01/21
Lead, Total	1514	1951	mg/kg	500	0.1	EPA 3051/6020B	06/01/21
Mercury, Total	2.96	3.81	mg/kg	2	0.2	EPA 3051/7470A	06/01/21
Hexavalent Chromium, Total	1.43	1.84	mg/kg	10	0.010	EPA 3060A	06/01/21
Total Volatile Residue	7.21		%			SM2540G/E	05/25/21
pH, as received	11.98		SU			EPA 9045D	05/25/21
Solids	77.6		%			SM2540G	05/23/21
Moisture	22.4		%			SM2540G	05/23/21

Ken Smith, Laboratory Director

36737 Covanta Honolulu Quarterly Report 1-10 Compiled by DAM/rdh

Certifications: NJ NELAP NC009, NY ELAP 11889 and NC DWQ DENR 604

Element One Inc.
6319-D Carolina Beach Rd.
Wilmington, NC 28412

Phone: 910 793-0128
Fax: 910 792-6853
e1lab@e1lab.com

elementOne

SUMMARY OF TCLP ANALYSES
Element One, Inc. Project Number e36737

Covanta Honolulu, Inc.
91-174 Hanua Street
Kapolei, HI 96707

June 2, 2021
Client Project Name 2Q21 Unit 3 Ash Sampling
Client Project Number

Sample ID: HON/CA/04-16-21/14:30/U3/6c

Sample Matrix	Combined Ash	Sample Type	Truck	Date Received	05/21/2021
Date Combined	04/16/2021	Time Sampled	1430	Time Received	0955
Sampler		Delivered by	UPS	Received by	LLB
Extraction Begun	05/23/21 1500	Extraction Ended	05/24/21 0840	E1 Sample #	36737-6

Parameter	Result	Unit	Calc. RL	Dilution	DL	Method	Date
Chromium, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/25/21
Arsenic, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/25/21
Selenium, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/25/21
Silver, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/25/21
Cadmium, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/25/21
Barium, TCLP digested	1.78	mg/L	0.05	50	0.001	EPA 1311/6020B	05/25/21
Lead, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/25/21
Mercury, TCLP digested	< 0.0004	mg/L	0.0004	2	0.0002	EPA 1311/7470A	05/25/21
Solids	75.8	%				SM2540G	05/23/21
pH, Initial	12.90	SU				EPA 1311	05/23/21
Fluid Determination pH	11.76	SU				EPA 1311	05/23/21
TCLP pH, Final	9.81	SU				EPA 1311	05/24/21
pH, Extraction Fluid #2	2.86	SU				EPA 1311	05/23/21

Ken Smith, Laboratory Director

elementOne

Element One Inc.
6319-D Carolina Beach Rd.
Wilmington, NC 28412

Phone: 910 793-0128
Fax: 910 792-6853
e1lab@e1lab.com

SUMMARY OF TOTAL ANALYSES
Element One, Inc. Project Number e36737

Covanta Honolulu, Inc.
91-174 Hanua Street
Kapolei, HI 96707

June 2, 2021
Client Project Name 2Q21 Unit 3 Ash Sampling
Client Project Number

Sample ID: HON/CA/04-16-21/14:30/U3/6c

Sample Matrix	Combined Ash	Sample Type	Truck	Date Received	05/21/2021
Date Combined	04/16/2021	Time Sampled	1430	Time Received	0955
Sampler		Delivered by	UPS	Received by	LLB
				E1 Sample #	36737-6 TOT

Parameter	Result As Received	Result Dry Basis	Unit	Dilution	DL	Method	Date
Chromium, Total	153	202	mg/kg	25	0.1	EPA 3051/6020B	06/01/21
Arsenic, Total	67.6	89.2	mg/kg	25	0.1	EPA 3051/6020B	06/01/21
Selenium, Total	8.60	11.3	mg/kg	25	0.1	EPA 3051/6020B	06/01/21
Silver, Total	52.4	69.1	mg/kg	25	0.1	EPA 3051/6020B	06/01/21
Cadmium, Total	54.9	72.4	mg/kg	25	0.1	EPA 3051/6020B	06/01/21
Barium, Total	403	532	mg/kg	25	0.1	EPA 3051/6020B	06/01/21
Lead, Total	1105	1458	mg/kg	500	0.1	EPA 3051/6020B	06/01/21
Mercury, Total	1.99	2.63	mg/kg	2	0.2	EPA 3051/7470A	06/01/21
Hexavalent Chromium, Total	0.454	0.599	mg/kg	10	0.010	EPA 3060A	06/01/21
Total Volatile Residue	3.70		%			SM2540G/E	05/25/21
pH, as received	11.96		SU			EPA 9045D	05/25/21
Solids	75.8		%			SM2540G	05/23/21
Moisture	24.2		%			SM2540G	05/23/21

Ken Smith, Laboratory Director

36737 Covanta Honolulu Quarterly Report 1-10 Compiled by DAM/RLS

Certifications: NJ NELAP NC009, NY ELAP 11889 and NC DWQ DENR 604

Element One Inc.
6319-D Carolina Beach Rd.
Wilmington, NC 28412

Phone: 910 793-0128
Fax: 910 792-6853
e1lab@e1lab.com

elementOne

SUMMARY OF TCLP ANALYSES
Element One, Inc. Project Number e36737

Covanta Honolulu, Inc.
91-174 Hanua Street
Kapolei, HI 96707

June 2, 2021
Client Project Name 2Q21 Unit 3 Ash Sampling
Client Project Number

Sample ID: HON/CA/04-17-21/22:07/U3/7a

Sample Matrix	Combined Ash	Sample Type	Truck	Date Received	05/21/2021
Date Combined	04/17/2021	Time Sampled	2207	Time Received	0955
Sampler		Delivered by	UPS	Received by	LLB
Extraction Begun	05/23/21 1500	Extraction Ended	05/24/21 0840	E1 Sample #	36737-7

Parameter	Result	Unit	Calc. RL	Dilution	DL	Method	Date
Chromium, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/25/21
Arsenic, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/25/21
Selenium, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/25/21
Silver, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/25/21
Cadmium, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/25/21
Barium, TCLP digested	0.710	mg/L	0.05	50	0.001	EPA 1311/6020B	05/25/21
Lead, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/25/21
Mercury, TCLP digested	< 0.0004	mg/L	0.0004	2	0.0002	EPA 1311/7470A	05/25/21
Solids	84.2	%				SM2540G	05/23/21
pH, Initial	12.80	SU				EPA 1311	05/23/21
Fluid Determination pH	10.10	SU				EPA 1311	05/23/21
TCLP pH, Final	8.98	SU				EPA 1311	05/24/21
pH, Extraction Fluid #2	2.86	SU				EPA 1311	05/23/21

Ken Smith, Laboratory Director

elementOne

Element One Inc.
6319-D Carolina Beach Rd.
Wilmington, NC 28412

Phone: 910 793-0128
Fax: 910 792-6853
e1lab@e1lab.com

SUMMARY OF TOTAL ANALYSES
Element One, Inc. Project Number e36737

Covanta Honolulu, Inc.
91-174 Hanua Street
Kapolei, HI 96707

June 2, 2021
Client Project Name 2Q21 Unit 3 Ash Sampling
Client Project Number

Sample ID: HON/CA/04-17-21/22:07/U3/7a

Sample Matrix	Combined Ash	Sample Type	Truck	Date Received	05/21/2021
Date Combined	04/17/2021	Time Sampled	2207	Time Received	0955
Sampler		Delivered by	UPS	Received by	LLB
				E1 Sample #	36737-7 TOT

Parameter	Result As Received	Result Dry Basis	Unit	Dilution	DL	Method	Date
Chromium, Total	111	132	mg/kg	25	0.1	EPA 3051/6020B	06/01/21
Arsenic, Total	75.5	89.7	mg/kg	25	0.1	EPA 3051/6020B	06/01/21
Selenium, Total	11.4	13.5	mg/kg	25	0.1	EPA 3051/6020B	06/01/21
Silver, Total	6.39	7.59	mg/kg	25	0.1	EPA 3051/6020B	06/01/21
Cadmium, Total	61.0	72.4	mg/kg	25	0.1	EPA 3051/6020B	06/01/21
Barium, Total	365	433	mg/kg	25	0.1	EPA 3051/6020B	06/01/21
Lead, Total	1266	1504	mg/kg	500	0.1	EPA 3051/6020B	06/01/21
Mercury, Total	1.40	1.66	mg/kg	2	0.2	EPA 3051/7470A	06/01/21
Hexavalent Chromium, Total	< 0.192	< 0.228	mg/kg	10	0.010	EPA 3060A	06/01/21
Total Volatile Residue	7.18		%			SM2540G/E	05/25/21
pH, as received	12.03		SU			EPA 9045D	05/25/21
Solids	84.2		%			SM2540G	05/23/21
Moisture	15.8		%			SM2540G	05/23/21

Ken Smith, Laboratory Director

36737 Covanta Honolulu Quarterly Report 1-10 Compiled by DAM

Certifications: NJ NELAP NC009, NY ELAP 11889 and NC DWQ DENR 604

Element One Inc.
6319-D Carolina Beach Rd.
Wilmington, NC 28412

Phone: 910 793-0128
Fax: 910 792-6853
e1lab@e1lab.com

elementOne

SUMMARY OF TCLP ANALYSES
Element One, Inc. Project Number e36737

Covanta Honolulu, Inc.
91-174 Hanua Street
Kapolei, HI 96707

June 2, 2021
Client Project Name 2Q21 Unit 3 Ash Sampling
Client Project Number

Sample ID: HON/CA/04-18-21/13:15/U3/8b

Sample Matrix	Combined Ash	Sample Type	Truck	Date Received	05/21/2021
Date Combined	04/18/2021	Time Sampled	1315	Time Received	0955
Sampler		Delivered by	UPS	Received by	LLB
Extraction Begun	05/23/21 1500	Extraction Ended	05/24/21 0840	E1 Sample #	36737-8

Parameter	Result	Unit	Calc. RL	Dilution	DL	Method	Date
Chromium, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/25/21
Arsenic, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/25/21
Selenium, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/25/21
Silver, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/25/21
Cadmium, TCLP digested	0.115	mg/L	0.05	50	0.001	EPA 1311/6020B	05/25/21
Barium, TCLP digested	0.791	mg/L	0.05	50	0.001	EPA 1311/6020B	05/25/21
Lead, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/25/21
Mercury, TCLP digested	< 0.0004	mg/L	0.0004	2	0.0002	EPA 1311/7470A	05/25/21
Solids	78.1	%				SM2540G	05/23/21
pH, Initial	12.97	SU				EPA 1311	05/23/21
Fluid Determination pH	11.17	SU				EPA 1311	05/23/21
TCLP pH, Final	8.36	SU				EPA 1311	05/24/21
pH, Extraction Fluid #2	2.86	SU				EPA 1311	05/23/21

Ken Smith, Laboratory Director

36737 Covanta Honolulu Quarterly Report 1-10 Compiled by DM/KH

elementOne

Element One Inc.
6319-D Carolina Beach Rd.
Wilmington, NC 28412

Phone: 910 793-0128
Fax: 910 792-6853
e1lab@e1lab.com

SUMMARY OF TOTAL ANALYSES
Element One, Inc. Project Number e36737

Covanta Honolulu, Inc.
91-174 Hanua Street
Kapolei, HI 96707

June 2, 2021
Client Project Name 2Q21 Unit 3 Ash Sampling
Client Project Number

Sample ID: HON/CA/04-18-21/13:15/U3/8b

Sample Matrix	Combined Ash	Sample Type	Truck	Date Received	05/21/2021
Date Combined	04/18/2021	Time Sampled	1315	Time Received	0955
Sampler		Delivered by	UPS	Received by	LLB
				E1 Sample #	36737-8 TOT

Parameter	Result As Received	Result Dry Basis	Unit	Dilution	DL	Method	Date
Chromium, Total	72.6	93.0	mg/kg	25	0.1	EPA 3051/6020B	06/01/21
Arsenic, Total	38.6	49.4	mg/kg	25	0.1	EPA 3051/6020B	06/01/21
Selenium, Total	5.28	6.76	mg/kg	25	0.1	EPA 3051/6020B	06/01/21
Silver, Total	< 2.48	< 3.18	mg/kg	25	0.1	EPA 3051/6020B	06/01/21
Cadmium, Total	37.0	47.4	mg/kg	25	0.1	EPA 3051/6020B	06/01/21
Barium, Total	305	391	mg/kg	25	0.1	EPA 3051/6020B	06/01/21
Lead, Total	1216	1557	mg/kg	500	0.1	EPA 3051/6020B	06/01/21
Mercury, Total	0.828	1.06	mg/kg	2	0.2	EPA 3051/7470A	06/01/21
Hexavalent Chromium, Total	< 0.194	< 0.248	mg/kg	10	0.010	EPA 3060A	06/01/21
Total Volatile Residue	4.87		%			SM2540G/E	05/25/21
pH, as received	12.06		SU			EPA 9045D	05/25/21
Solids	78.1		%			SM2540G	05/23/21
Moisture	21.9		%			SM2540G	05/23/21

Ken Smith, Laboratory Director

36737 Covanta Honolulu Quarterly Report 1-10 Compiled by DAM\ccb

Certifications: NJ NELAP NC009, NY ELAP 11889 and NC DWQ DENR 604

Element One Inc.
6319-D Carolina Beach Rd.
Wilmington, NC 28412

Phone: 910 793-0128
Fax: 910 792-6853
e1lab@e1lab.com

elementOne

SUMMARY OF TCLP ANALYSES
Element One, Inc. Project Number e36737

Covanta Honolulu, Inc.
91-174 Hanua Street
Kapolei, HI 96707

June 2, 2021
Client Project Name 2Q21 Unit 3 Ash Sampling
Client Project Number

Sample ID: HON/CA/04-19-21/08:30/U3/9c

Sample Matrix	Combined Ash	Sample Type	Truck	Date Received	05/21/2021
Date Combined	04/19/2021	Time Sampled	0830	Time Received	0955
Sampler		Delivered by	UPS	Received by	LLB
Extraction Begun	05/23/21 1500	Extraction Ended	05/24/21 0840	E1 Sample #	36737-9

Parameter	Result	Unit	Calc. RL	Dilution	DL	Method	Date
Chromium, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/25/21
Arsenic, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/25/21
Selenium, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/25/21
Silver, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/25/21
Cadmium, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/25/21
Barium, TCLP digested	0.746	mg/L	0.05	50	0.001	EPA 1311/6020B	05/25/21
Lead, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/25/21
Mercury, TCLP digested	< 0.0004	mg/L	0.0004	2	0.0002	EPA 1311/7470A	05/25/21
Solids	82.5	%				SM2540G	05/23/21
pH, Initial	12.87	SU				EPA 1311	05/23/21
Fluid Determination pH	11.96	SU				EPA 1311	05/23/21
TCLP pH, Final	10.05	SU				EPA 1311	05/24/21
pH, Extraction Fluid #2	2.86	SU				EPA 1311	05/23/21

Ken Smith, Laboratory Director

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Certifications: NJ NELAP NC009, NY ELAP 11889 and NC DWQ DENR 604

elementOne

Element One Inc.
6319-D Carolina Beach Rd.
Wilmington, NC 28412

Phone: 910 793-0128
Fax: 910 792-6853
e1lab@e1lab.com

SUMMARY OF TOTAL ANALYSES
Element One, Inc. Project Number e36737

Covanta Honolulu, Inc.
91-174 Hanua Street
Kapolei, HI 96707

June 2, 2021
Client Project Name 2Q21 Unit 3 Ash Sampling
Client Project Number

Sample ID: HON/CA/04-19-21/08:30/U3/9c

Sample Matrix	Combined Ash	Sample Type	Truck	Date Received	05/21/2021
Date Combined	04/19/2021	Time Sampled	0830	Time Received	0955
Sampler		Delivered by	UPS	Received by	LLB
				E1 Sample #	36737-9 TOT

Parameter	Result As Received	Result Dry Basis	Unit	Dilution	DL	Method	Date
Chromium, Total	71.7	86.9	mg/kg	25	0.1	EPA 3051/6020B	06/01/21
Arsenic, Total	50.3	61.0	mg/kg	25	0.1	EPA 3051/6020B	06/01/21
Selenium, Total	5.91	7.16	mg/kg	25	0.1	EPA 3051/6020B	06/01/21
Silver, Total	3.36	4.07	mg/kg	25	0.1	EPA 3051/6020B	06/01/21
Cadmium, Total	50.7	61.5	mg/kg	25	0.1	EPA 3051/6020B	06/01/21
Barium, Total	322	390	mg/kg	25	0.1	EPA 3051/6020B	06/01/21
Lead, Total	954	1156	mg/kg	500	0.1	EPA 3051/6020B	06/01/21
Mercury, Total	1.52	1.84	mg/kg	2	0.2	EPA 3051/7470A	06/01/21
Hexavalent Chromium, Total	0.640	0.776	mg/kg	10	0.010	EPA 3060A	06/01/21
Total Volatile Residue	4.19		%			SM2540G/E	05/25/21
pH, as received	12.20		SU			EPA 9045D	05/25/21
Solids	82.5		%			SM2540G	05/23/21
Moisture	17.5		%			SM2540G	05/23/21

Ken Smith, Laboratory Director

36737 Covanta Honolulu Quarterly Report 1-10 Compiled by DM/CH

Certifications: NJ NELAP NC009, NY ELAP 11889 and NC DWQ DENR 604

Element One Inc.
6319-D Carolina Beach Rd.
Wilmington, NC 28412

Phone: 910 793-0128
Fax: 910 792-6853
e1lab@e1lab.com

elementOne

SUMMARY OF TCLP ANALYSES
Element One, Inc. Project Number e36737

Covanta Honolulu, Inc.
91-174 Hanua Street
Kapolei, HI 96707

June 2, 2021
Client Project Name 2Q21 Unit 3 Ash Sampling
Client Project Number

Sample ID: HON/CA/04-19-21/13:15/U3/10a

Sample Matrix	Combined Ash	Sample Type	Truck	Date Received	05/21/2021
Date Combined	04/19/2021	Time Sampled	1315	Time Received	0955
Sampler		Delivered by	UPS	Received by	LLB
Extraction Begun	05/23/21 1500	Extraction Ended	05/24/21 0840	E1 Sample #	36737-10

Parameter	Result	Unit	Calc. RL	Dilution	DL	Method	Date
Chromium, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/25/21
Arsenic, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/25/21
Selenium, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/25/21
Silver, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/25/21
Cadmium, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/25/21
Barium, TCLP digested	0.851	mg/L	0.05	50	0.001	EPA 1311/6020B	05/25/21
Lead, TCLP digested	< 0.05	mg/L	0.05	50	0.001	EPA 1311/6020B	05/25/21
Mercury, TCLP digested	< 0.0004	mg/L	0.0004	2	0.0002	EPA 1311/7470A	05/25/21
Solids	81.8	%				SM2540G	05/23/21
pH, Initial	12.95	SU				EPA 1311	05/23/21
Fluid Determination pH	11.99	SU				EPA 1311	05/23/21
TCLP pH, Final	10.36	SU				EPA 1311	05/24/21
pH, Extraction Fluid #2	2.86	SU				EPA 1311	05/23/21

Ken Smith, Laboratory Director

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Certifications: NJ NELAP NC009, NY ELAP 11889 and NC DWQ DENR 604

Element One Inc.
6319-D Carolina Beach Rd.
Wilmington, NC 28412

Phone: 910 793-0128
Fax: 910 792-6853
e1lab@e1lab.com

elementOne

SUMMARY OF TOTAL ANALYSES
Element One, Inc. Project Number e36737

Covanta Honolulu, Inc.
91-174 Hanua Street
Kapolei, HI 96707

June 2, 2021
Client Project Name 2Q21 Unit 3 Ash Sampling
Client Project Number

Sample ID: HON/CA/04-19-21/13:15/U3/10a

Sample Matrix	Combined Ash	Sample Type	Truck	Date Received	05/21/2021
Date Combined	04/19/2021	Time Sampled	1315	Time Received	0955
Sampler		Delivered by	UPS	Received by	LLB
				E1 Sample #	36737-10 TOT

Parameter	Result As Received	Result Dry Basis	Unit	Dilution	DL	Method	Date
Chromium, Total	68.8	84.1	mg/kg	25	0.1	EPA 3051/6020B	06/01/21
Arsenic, Total	44.0	53.8	mg/kg	25	0.1	EPA 3051/6020B	06/01/21
Selenium, Total	4.58	5.60	mg/kg	25	0.1	EPA 3051/6020B	06/01/21
Silver, Total	119	145	mg/kg	25	0.1	EPA 3051/6020B	06/01/21
Cadmium, Total	43.8	53.5	mg/kg	25	0.1	EPA 3051/6020B	06/01/21
Barium, Total	775	947	mg/kg	500	0.1	EPA 3051/6020B	06/01/21
Lead, Total	1081	1322	mg/kg	500	0.1	EPA 3051/6020B	06/01/21
Mercury, Total	1.17	1.43	mg/kg	2	0.2	EPA 3051/7470A	06/01/21
Hexavalent Chromium, Total	0.331	0.405	mg/kg	10	0.010	EPA 3060A	06/01/21
Total Volatile Residue	7.41		%			SM2540G/E	05/25/21
pH, as received	12.25		SU			EPA 9045D	05/25/21
Solids	81.8		%			SM2540G	05/23/21
Moisture	18.2		%			SM2540G	05/23/21

Ken Smith, Laboratory Director

36737 Covanta Honolulu Quarterly Report 1-10 Compiled by DRM/CW

Certifications: NJ NELAP NC009, NY ELAP 11889 and NC DWQ DENR 604

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CHAIN OF CUSTODY – ASH

Designed for EMIS v5

Lab ID # 36737

Facility	Covanta Honolulu H-Power	PO#		Report to (Email)	kasato@covanta.com		+ Email ID	jcoyne@covanta.com	
Address	91-174 Hanua Street, Kapolei HI 96707	Billing information, if different					+ Email ID		
Contact Name	Katelyn Asato	Email	kasato@covanta.com	Phone	808-426-0852	Fax	808-682-5203	Project ID	2Q21 Unit 3 Ash Sampling
Delivery Date		TAT (circle one)	Normal	Rush:	1-Day	2-Day	3-Day		

Instructions: Use legend shown below to identify Purpose, Sample Location, Ash Type and Sample Type. For changes to this form, contact the Corporate Ash Team.

Purpose	Sample Location		Ash Type	Sample Type			
				Composite			Other
Characterize	Belt	FEL:FrontEnd Loader	Combined Ash: CA				
Process Knowledge	Crane	Truck	Bottom Ash: BA	2-Hr: 2H	8-Hr: 8H	Quarter: QC	Grab: GR
R&D	Pile	Super Sac	Fly Ash: FA	4-Hr: 4H	Daily: DC	Truck: TR	
	Pugmill	Dust Master	Ratio Sample: RS	6-Hr: 6H	Week: WC	Day Shift: AM	
	Belt/Pugmill			7-Hr: 7H	Month: MC	NightShift: PM	

Ref No.	Sample ID on Label (3-DigitFacID/AshType/Date/Time)	Purpose	Sample Location	Ash Type	Sample Type	Sample #	Aliquot #	Sample Collection Start Date	Sample Collection Start Time	# Container (s)	TCLP Fluid pH	TCLP Metals	Total Metals 6020	pH 9045	Hg 7470A	Hexavalent Cr 3060A / 7199	%-volatiles, moisture	Alkalinity / mEq	Remarks
1	HON / CA / 04-14-21 / 02:30 / U3 / 1a	Characterize	Pile	CA	TR	1	1	4/14/2021	2:30 AM	1	X	X	X	X	X	X	X	X	Please pick 1 of 3 aliquots to analyze
2	HON / CA / 04-14-21 / 02:30 / U3 / 1b	Characterize	Pile	CA	TR	1	2	4/14/2021	2:30 AM	1									
3	HON / CA / 04-14-21 / 02:30 / U3 / 1c	Characterize	Pile	CA	TR	1	3	4/14/2021	2:30 AM	1									
4	HON / CA / 04-14-21 / 22:00 / U3 / 2a	Characterize	Pile	CA	TR	1	1	4/14/2021	10:00 PM	1	X	X	X	X	X	X	X	X	Please pick 1 of 3 aliquots to analyze
5	HON / CA / 04-14-21 / 22:00 / U3 / 2b	Characterize	Pile	CA	TR	1	2	4/14/2021	10:00 PM	1									
6	HON / CA / 04-14-21 / 22:00 / U3 / 2c	Characterize	Pile	CA	TR	1	3	4/14/2021	10:00 PM	1									
7	HON / CA / 04-15-21 / 23:48 / U3 / 3a	Characterize	Pile	CA	TR	1	1	4/15/2021	11:48 PM	1	X	X	X	X	X	X	X	X	Please pick 1 of 3 aliquots to analyze
8	HON / CA / 04-15-21 / 23:48 / U3 / 3b	Characterize	Pile	CA	TR	1	2	4/15/2021	11:48 PM	1									
9	HON / CA / 04-15-21 / 23:48 / U3 / 3c	Characterize	Pile	CA	TR	1	3	4/15/2021	11:48 PM	1									
10	HON / CA / 04-16-21 / 06:00 / U3 / 4a	Characterize	Pile	CA	TR	1	1	4/16/2021	6:00 AM	1	X	X	X	X	X	X	X	X	Please pick 1 of 3 aliquots to analyze
11	HON / CA / 04-16-21 / 06:00 / U3 / 4b	Characterize	Pile	CA	TR	1	2	4/16/2021	6:00 AM	1									
12	HON / CA / 04-16-21 / 06:00 / U3 / 4c	Characterize	Pile	CA	TR	1	3	4/16/2021	6:00 AM	1									
13	HON / CA / 04-16-21 / 08:30 / U3 / 5a	Characterize	Pile	CA	TR	1	1	4/16/2021	8:30 AM	1	X	X	X	X	X	X	X	X	Please pick 1 of 3 aliquots to analyze
14	HON / CA / 04-16-21 / 08:30 / U3 / 5b	Characterize	Pile	CA	TR	1	2	4/16/2021	8:30 AM	1									
15	HON / CA / 04-16-21 / 08:30 / U3 / 5c	Characterize	Pile	CA	TR	1	3	4/16/2021	8:30 AM	1									

Analyses Requested

Notes:

Please pick 1 of the 3 provided aliquots to first analyze for TCLP pH. Please contact John, Amanda or Katelyn with pH prior to completing other analyses.

Relinquished by	Name	Lisa Bruton	Date	05-18-2021	Time	02:30	Signature
Received by lab	Name		Date	5/21/21	Time	0955	Signature
Lab Notes							

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CHAIN OF CUSTODY – ASH

Designed for EMIS v5

Lab ID # 36737

Facility	Covanta Honolulu H-Power	PO#		Report to (Email)	kasato@covanta.com	+ Email ID	jcoyne@covanta.com		
Address	91-174 Hanua Street, Kapolei HI 96707	Billing information, if different				+ Email ID			
Contact Name	Katelyn Asato	Email	kasato@covanta.com	Phone	808-426-0852	Fax	808-682-5203	Project ID	2Q21 Unit 3 Ash Sampling
Delivery Date		TAT (circle one)	Normal	Rush:	1-Day	2-Day	3-Day		

Instructions: Use legend shown below to identify Purpose, Sample Location, Ash Type and Sample Type. For changes to this form, contact the Corporate Ash Team.

Purpose	Sample Location		Ash Type	Sample Type			
				Composite			Other
Characterize	Belt	FEL:FrontEnd Loader	Combined Ash: CA	2-Hr: 2H	8-Hr: 8H	Quarter: QC	Grab: GR
Process Knowledge	Crane	Truck	Bottom Ash: BA	4-Hr: 4H	Daily: DC	Truck: TR	
R&D	Pile	Super Sac	Fly Ash: FA	6-Hr: 6H	Week: WC	Day Shift: AM	
	Pugmill	Dust Master	Reflo Sample: RS	7-Hr: 7H	Month: MC	NightShift: PM	
	Belt/Pugmill						

Ref No.	Sample ID on Label (3-Digit FacID/AshType/Date/Time)	Purpose	Sample Location	Ash Type	Sample Type	Sample #	Aliquot #	Sample Collection Start Date	Sample Collection Start Time	# Container (s)	TCLP Fluid pH	TCLP Metals	Total Metals 6020	pH 9045	Hg 7470A	Hexavalent Cr 3060A / 7199	%-volatiles, moisture	Alkalinity / mEq	Remarks
16	HON / CA / 04-16-21 / 14:30 / U3 / 6a	Characterize	Pile	CA	TR	1	1	4/16/2021	2:30 PM	1	X	X	X	X	X	X	X	X	Please pick 1 of 3 aliquots to analyze
17	HON / CA / 04-16-21 / 14:30 / U3 / 6b	Characterize	Pile	CA	TR	1	2	4/16/2021	2:30 PM	1									
18	HON / CA / 04-16-21 / 14:30 / U3 / 6c	Characterize	Pile	CA	TR	1	3	4/16/2021	2:30 PM	1									
19	HON / CA / 04-17-21 / 22:07 / U3 / 7a	Characterize	Pile	CA	TR	1	1	4/17/2021	10:07 PM	1	X	X	X	X	X	X	X	X	Please pick 1 of 3 aliquots to analyze
20	HON / CA / 04-17-21 / 22:07 / U3 / 7b	Characterize	Pile	CA	TR	1	2	4/17/2021	10:07 PM	1									
21	HON / CA / 04-17-21 / 22:07 / U3 / 7c	Characterize	Pile	CA	TR	1	3	4/17/2021	10:07 PM	1									
22	HON / CA / 04-18-21 / 13:15 / U3 / 8a	Characterize	Pile	CA	TR	1	1	4/18/2021	1:15 PM	1	X	X	X	X	X	X	X	X	Please pick 1 of 3 aliquots to analyze
23	HON / CA / 04-18-21 / 13:15 / U3 / 8b	Characterize	Pile	CA	TR	1	2	4/18/2021	1:15 PM	1									
24	HON / CA / 04-18-21 / 13:15 / U3 / 8c	Characterize	Pile	CA	TR	1	3	4/18/2021	1:15 PM	1									
25	HON / CA / 04-19-21 / 08:30 / U3 / 9a	Characterize	Pile	CA	TR	1	1	4/19/2021	8:30 AM	1	X	X	X	X	X	X	X	X	Please pick 1 of 3 aliquots to analyze
26	HON / CA / 04-19-21 / 08:30 / U3 / 9b	Characterize	Pile	CA	TR	1	2	4/19/2021	8:30 AM	1									
27	HON / CA / 04-19-21 / 08:30 / U3 / 9c	Characterize	Pile	CA	TR	1	3	4/19/2021	8:30 AM	1									
28	HON / CA / 04-19-21 / 13:15 / U3 / 10a	Characterize	Pile	CA	TR	1	1	4/19/2021	1:15 PM	1	X	X	X	X	X	X	X	X	Please pick 1 of 3 aliquots to analyze
29	HON / CA / 04-19-21 / 13:15 / U3 / 10b	Characterize	Pile	CA	TR	1	2	4/19/2021	1:15 PM	1									
30	HON / CA / 04-19-21 / 13:15 / U3 / 10c	Characterize	Pile	CA	TR	1	3	4/19/2021	1:15 PM	1									

Analyses Requested

Notes:

Please pick 1 of the 3 provided aliquots to first analyze for TCLP pH. Please contact John, Amanda or Katelyn with pH prior to completing other analyses.

Relinquished by	Name	[signature]	Date		Time		Signature	
Received by lab	Name	Lisa Bruton	Date	5.21.21	Time	0955	Signature	[signature]
Lab Notes								

Appendix A

Sample Management

Report No. 10562480_8290FC_DFR

CHAIN-OF-CUSTODY Analytical Request Document

Pace Analytical

Chain-of-Custody is a LEGAL DOCUMENT - Complete all relevent fields

LAB USE ONLY- Affix Work

WO# : 10562480

10562480

ALL SHAD

Container Preservative

** Preservative Types: (1) nitric acid, (2) sulfuric acid, (3) hydrochloric acid, (4) sodium hydroxide, (5) zinc acetate, (6) methanol, (7) sodium bisulfate, (8) sodium thiosulfate, (9) hexane, (A) ascorbic acid, (B) ammonium sulfate, (C) ammonium hydroxide, (D) TSP, (U) Unpreserved, (O) Other _____

Company: Covanta Hpower	Billing Information: Same
Address: 91-174 Hanua Street, Kapolei, HI 96707	
Report To: Katelyn Asato	Email To: kasato@covanta.com
Copy To:	Site Collection Info/Address: 91-174 Hanua Street, Kapolei, HI 96707
Customer Project Name/Number: Q2-2021 MBN Ash Sampling	State: / County/City: Time Zone Collected: [ ]PT [ ]MT [ ]CT [ ]ET
Phone: (808)-426-0852 Email: kasato@covanta.com	Site/Facility ID #: Compliance Monitoring? [ ] Yes [ ] No
Collected By (print): Katelyn Asato	Purchase Order #: Quote #: DW PWS ID #: DW Location Code:
Collected By (signature):	Turnaround Date Required: N/A Immediately Packed on Ice: [ ] Yes [X] No
Sample Disposal: [X] Dispose as appropriate [ ] Return [ ] Archive: _____ [ ] Hold: _____	Rush: [ ] Same Day [ ] Next Day [ ] 2 Day [ ] 3 Day [ ] 4 Day [X] 5 Day (Expedite Charges Apply) Field Filtered (if applicable): [ ] Yes [ ] No Analysis:

* Matrix Codes (Insert in Matrix box below): Drinking Water (DW), Ground Water (GW), Wastewater (WW), Product (P), Soil/Solid (SL), Oil (OL), Wipe (WP), Air (AR), Tissue (TS), Bioassay (B), Vapor (V), Other (OT)

Customer Sample ID	Matrix *	Comp / Grab	Collected (or Composite Start) Date	Collected (or Composite Start) Time	Composite End Date	Composite End Time	Res Cl	# of Ctns	Analyses: Dioxin / Furans 8290T-O with TEQ
MBN Q2-2021 Ash Sample	OT	COMP	05-13-21	2:00				1	X

Analyses

Lab Profile/Line:

Lab Sample Receipt Checklist:

Custody Seals Present/Intact	Y N NA
Custody Signatures Present	Y N NA
Collector Signature Present	Y N NA
Bottles Intact	Y N NA
Correct Bottles	Y N NA
Sufficient Volume	Y N NA
Samples Received on Ice	Y N NA
VOA ~ Headspace Acceptable	Y N NA
USDA Regulated Soils	Y N NA
Samples in Holding Time	Y N NA
Residual Chlorine Present	Y N NA
Cl Strips: _____	
Sample pH Acceptable	Y N NA
pH Strips: _____	
Sulfide Present	Y N NA
Lead Acetate Strips: _____	

LAB USE ONLY:
Lab Sample # / Comments:

001

Customer Remarks / Special Conditions / Possible Hazards:

Type of Ice Used: Wet Blue Dry None

Packing Material Used:

Radchem sample(s) screened (<500 cpm): Y N NA

SHORT HOLDS PRESENT (<72 hours): Y N N/A

Lab Tracking #:

Samples received via: FEDEX UPS Client Courier Pace Courier

LAB Sample Temperature Info:
Temp Blank Received: Y (N) NA
Therm ID#: 2
Cooler 1 Temp Upon Receipt: __oC
Cooler 1 Therm Corr. Factor: __oC
Cooler 1 Corrected Temp: 20.6oC
Comments:

Relinquished by/Company: (Signature)	Date/Time: 05-18-2021 / 3:00	Received by/Company: (Signature) Pace	Date/Time: 5/21/21 9:10
Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:
Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:

MTJL LAB USE ONLY
Table #:
Acctnum:
Template:
Prelogin:
PM:
PB:

Trip Blank Received: Y N NA
HCL MeOH TSP Other

Non Conformance(s): YES / NO

Page: ____ of: ____

Pace Analytical	Document Name: Sample Condition Upon Receipt (SCUR) - MN	Document Revised: 14Apr2021 Page 1 of 1
	Document No.: ENV-FRM-MIN4-0150 Rev.02	Pace Analytical Services - Minneapolis

Sample Condition Upon Receipt

Client Name: Covanta Hpower

Project #: WO#: 10562480

PM: AW1 Due Date: 06/07/21

CLIENT: COV

Courier: ☐Fed Ex ☑UPS ☐USPS ☐Client ☐Pace ☐SpeeDee ☐Commercial 1

Tracking Number: 1ZIVX6830294156497 See Exceptions ☐ ENV-FRM-MIN4-0142

Custody Seal on Cooler/Box Present? ☐Yes ☑No **Seals Intact?** ☐Yes ☑No **Biological Tissue Frozen?** ☐Yes ☐No ☑N/A

Packing Material: ☑Bubble Wrap ☐Bubble Bags ☐None ☐Other:_____ **Temp Blank?** ☐Yes ☑No

Thermometer: ☐T1(0461) ☑T2(1336) ☐T3(0459) ☐OS418-LS ☐T4(0254) ☐T5(0489) ☐160285052 **Type of Ice:** ☒Wet ☐Blue ☐None ☐Dry ☐Melted

Did Samples Originate in West Virginia? ☐Yes ☑No **Were All Container Temps Taken?** ☐Yes ☐No ☑N/A

Temp should be above freezing to 6°C **Cooler Temp Read w/temp blank:** 20.6 °C JT 5/21/21

Correction Factor: True **Cooler Temp Corrected w/temp blank:** 20.6 °C

Average Corrected Temp (no temp blank only): 20.6 °C ☐See Exceptions ENV-FRM-MIN4-0142 ☑1 Container

USDA Regulated Soil: (☑ N/A, water sample/Other:_____)

Date/Initials of Person Examining Contents: 5/21/21 JT

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA. MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? ☐Yes ☐No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐Yes ☐No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

				COMMENTS:
Chain of Custody Present and Filled Out?	☑Yes	☐No		1.
Chain of Custody Relinquished?	☑Yes	☐No		2.
Sampler Name and/or Signature on COC?	☑Yes	☐No	☐N/A	3.
Samples Arrived within Hold Time?	☑Yes	☐No		4.
Short Hold Time Analysis (<72 hr)?	☐Yes	☑No		5. ☐Fecal Coliform ☐HPC ☐Total Coliform/E coli ☐BOD/cBOD ☐Hex Chrome ☐Turbidity ☐Nitrate ☐Nitrite ☐Orthophos ☐Other_____
Rush Turn Around Time Requested?	☐Yes	☑No		6.
Sufficient Volume?	☑Yes	☐No		7.
Correct Containers Used? -Pace Containers Used?	☑Yes ☑Yes	☐No ☐No		8.
Containers Intact?	☑Yes	☐No		9.
Field Filtered Volume Received for Dissolved Tests?	☐Yes	☐No	☑N/A	10. Is sediment visible in the dissolved container? ☐Yes ☐No
Is sufficient information available to reconcile the samples to the COC? Matrix: ☐Water ☐Soil ☐Oil ☑Other Ash	☑Yes	☐No		11. If no, write ID/ Date/Time on Container Below: ☐See Exception ENV-FRM-MIN4-0142
All containers needing acid/base preservation have been checked?	☐Yes	☐No	☑N/A	12. Sample #
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, <2pH, NaOH >9 Sulfide, NaOH>10 Cyanide)	☐Yes	☐No	☑N/A	☐NaOH ☐HNO_3 ☐H_2SO_4 ☐Zinc Acetate
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin/PFAS	☑Yes	☐No	☐N/A	Positive for Res. Chlorine? ☐Yes ☐No pH Paper Lot# ☐See Exception ENV-FRM-MIN4-0142
				Res. Chlorine | 0-6 Roll | 0-6 Strip | 0-14 Strip
Extra labels present on soil VOA or WIDRO containers?	☐Yes	☐No	☑N/A	13. ☐See Exception ENV-FRM-MIN4-0140
Headspace in VOA Vials (greater than 6mm)?	☐Yes	☐No	☑N/A	
Trip Blank Present?	☐Yes	☐No	☑N/A	14.
Trip Blank Custody Seals Present?	☐Yes	☐No	☑N/A	Pace Trip Blank Lot # (if purchased):_____

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** ☐Yes ☐No

Person Contacted:_____ Date/Time:_____

Comments/Resolution:_____

Project Manager Review: Joanne Richardson **Date:** 5-27-21

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers).

Labeled by: RNC

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Reporting Flags

A = Reporting Limit based on signal to noise (EDL)

B = Less than 10x higher than method blank level

C = Result obtained from confirmation analysis

D = Result obtained from analysis of diluted sample

E = Exceeds calibration range

I = Interferencepresent

J = Estimated value

L = Suppressive interference, analyte may be biased low

Nn = Value obtained from additional analysis

P = PCDEInterference

R = Recovery outside target range

S = Peak saturated

U = Analyte not detected

V = Result verified by confirmation analysis

X = %D Exceeds limits

Y = Calculated using average of daily RFs

* = SeeDiscussion

REPORT OF LABORATORY ANALYSIS

Appendix B

Sample Analysis Summary

Pace Analytical Services, LLC.
1700 Elm Street
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444

www.pacelabs.com

Report Prepared for:

Katelyn Asato
Covanta
91-174 Hanua St.
Kapolei HI 96707

REPORT OF LABORATORY ANALYSIS FOR PCDD/PCDF

Report Prepared Date:
June 14, 2021

Report Information:

Pace Project #: 10562480
Sample Receipt Date: 05/21/2021
Client Project #: Q2-2021 MBN Ash Sampling
Client Sub PO #: HONOL-0000079264
State Cert #: MN00064

Invoicing & Reporting Options:

The report provided has been invoiced as a Level 2 PCDD/PCDF Report. If an upgrade of this report package is requested, an additional charge may be applied.

Please review the attached invoice for accuracy and forward any questions to Ashley Williams, your Pace Project Manager.

This report has been reviewed by:

Ashley Williams

June 14, 2021

Ashley Williams, Project Manager
(612) 346-8158
(612) 607-6444 (fax)
ashley.williams@pacelabs.com

Report of Laboratory Analysis

Pace Analytical Services, LLC.
1700 Elm Street
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444

DISCUSSION

This report presents the results from the analysis performed on one sample submitted by a representative of Covanta. The sample was analyzed for the presence or absence of polychlorodibenzo-p-dioxins (PCDDs) and polychlorodibenzofurans (PCDFs) using a modified version of USEPA Method 8290. The reporting limits were set to correspond to the lowest calibration points and a nominal 10-gram sample amount, and the sensitivity was verified by signal-to-noise measurements. The quantitation limits, adjusted for sample extraction amount, may be somewhat higher or lower than the reporting limits provided in this report. Estimated maximum possible concentration (EMPC) values were treated as positives in the toxic equivalence calculations. The sample was received above the recommended temperature range of 0-6 degrees Celsius.

Second column confirmation analyses of 2,3,7,8-TCDF values obtained from the primary (DB5-MS) column are performed only when specifically requested for a project and only when the values are above the concentration of the lowest calibration standard. Typical resolution for this isomer using the DB5-MS column ranges from 25-30%.

The isotopically-labeled PCDD/PCDF internal standards in the sample extract were recovered at 36-75%. Except for five low values, which were flagged "R" on the results tables, the labeled internal standard recoveries obtained for this project were within the 40-135% target range specified in Method 8290. Since the quantification of the native 2,3,7,8-substituted congeners was based on isotope dilution, the data were automatically corrected for recovery and accurate values were obtained. In cases where the estimated detection limits (EDLs) were above the standard reporting limits, the EDLs were provided and flagged "A".

A laboratory method blank was prepared and analyzed with the sample batch as part of our routine quality control procedures. The results show the blank to be free of PCDDs and PCDFs at the reporting limits.

Laboratory and matrix spike samples were also prepared with the sample batch using clean reference matrix or sample matrix that had been fortified with native standard materials. The results show that the spiked native compounds in the laboratory control spike were recovered at 92-122%; these results were within the target range for the method. Five background-subtracted recovery values obtained for the primary matrix spike sample were below the 70-130% target range and flagged "R" on the results table. Also, seven relative percent difference (RPD) values were above the 20% target upper limit. These deviations may be due to sample inhomogeneity.

Pace Analytical™

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Minnesota Laboratory Certifications

Authority	Certificate #
A2LA	2926.01
Alabama	40770
Alaska-DW	MN00064
Alaska-UST	17-009
Arizona	AZ0014
Arkansas - WW	88-0680
Arkansas-DW	MN00064
California	2929
Colorado	MN00064
Connecticut	PH-0256
Florida	E87605
Georgia	959
Hawaii	MN00064
Idaho	MN00064
Illinois	200011
Indiana	C-MN-01
Iowa	368
Kansas	E-10167
Kentucky-DW	90062
Kentucky-WW	90062
Louisiana-DEQ	AI-84596
Louisiana-DW	MN00064
Maine	MN00064
Maryland	322
Michigan	9909
Minnesota	027-053-137
Minnesota-Ag	via MN 027-053
Minnesota-Petr	1240
Mississippi	MN00064
Missouri	10100
Montana	CERT0092
Nebraska	NE-OS-18-06
Nevada	MN00064
New Hampshire	2081
New Jersey	MN002
New York	11647
North Carolina-	27700
North Carolina-	530
North Dakota	R-036
Ohio-DW	41244
Ohio-VAP (170	CL101
Ohio-VAP (180	CL110
Oklahoma	9507
Oregon- rimary	MN300001
Oregon-Second	MN200001
Pennsylvania	68-00563
Puerto Rico	MN00064
South Carolina	74003
Tennessee	TN02818
Texas	T104704192
Utah	MN00064
Vermont	VT-027053137
Virginia	460163
Washington	C486
West Virginia-D	382
West Virginia-D	9952C
Wisconsin	999407970
Wyoming-UST	via A2LA 2926.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Covanta

Client's Sample ID	MBN Q2-2021 Ash Sample		
Lab Sample ID	10562480001		
Filename	U210603B_16		
Injected By	SMT		
Total Amount Extracted	10.2 g	Matrix	Solid
% Moisture	17.6	Dilution	NA
Dry Weight Extracted	8.41 g	Collected	05/13/2021 02:00
ICAL ID	U210423	Received	05/21/2021 09:10
CCal Filename(s)	U210603B_01 & U210603B_18	Extracted	05/28/2021 12:30
Method Blank ID	BLANK-90395	Analyzed	06/04/2021 07:57

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	54	---	1.0		2,3,7,8-TCDF-13C	2.00	54
Total TCDF	1500	---	1.0		2,3,7,8-TCDD-13C	2.00	36 R
					1,2,3,7,8-PeCDF-13C	2.00	66
2,3,7,8-TCDD	ND	---	3.6	A	2,3,4,7,8-PeCDF-13C	2.00	70
Total TCDD	200	---	3.6		1,2,3,7,8-PeCDD-13C	2.00	75
					1,2,3,4,7,8-HxCDF-13C	2.00	53
1,2,3,7,8-PeCDF	78	---	5.0		1,2,3,6,7,8-HxCDF-13C	2.00	49
2,3,4,7,8-PeCDF	60	---	5.0		2,3,4,6,7,8-HxCDF-13C	2.00	64
Total PeCDF	970	---	5.0		1,2,3,7,8,9-HxCDF-13C	2.00	57
					1,2,3,4,7,8-HxCDD-13C	2.00	66
1,2,3,7,8-PeCDD	25	---	5.0		1,2,3,6,7,8-HxCDD-13C	2.00	59
Total PeCDD	190	---	5.0		1,2,3,4,6,7,8-HpCDF-13C	2.00	52
					1,2,3,4,7,8,9-HpCDF-13C	2.00	41
1,2,3,4,7,8-HxCDF	62	---	5.0		1,2,3,4,6,7,8-HpCDD-13C	2.00	49
1,2,3,6,7,8-HxCDF	65	---	5.0		OCDD-13C	4.00	39 R
2,3,4,6,7,8-HxCDF	46	---	5.0				
1,2,3,7,8,9-HxCDF	13	---	5.0		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	550	---	5.0		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	12	---	5.0		2,3,7,8-TCDD-37Cl4	0.20	39
1,2,3,6,7,8-HxCDD	20	---	5.0				
1,2,3,7,8,9-HxCDD	16	---	5.0				
Total HxCDD	210	---	5.0				
1,2,3,4,6,7,8-HpCDF	140	---	5.0		Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	16	---	5.0		Equivalence: 77 ng/Kg		
Total HpCDF	180	---	5.0		(Lower-bound - Using 2005 WHO Factors)		
1,2,3,4,6,7,8-HpCDD	120	---	5.0				
Total HpCDD	240	---	5.0				
OCDF	52	---	10				
OCDD	400	---	10				

Conc = Concentration (Totals include 2,3,7,8-substituted isomers)
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
A = Reporting Limit based on signal to noise (EDL)
R = Recovery outside target range

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 8290 Blank Analysis Results

Lab Sample Name	DFBLKHP		
Lab Sample ID	BLANK-90395	Matrix	Solid
Filename	U210603B_06	Dilution	NA
Total Amount Extracted	10.5 g	Extracted	05/28/2021 12:30
ICAL ID	U210423	Analyzed	06/04/2021 00:30
CCal Filename(s)	U210603B_01 & U210603B_18	Injected By	SMT

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg
2,3,7,8-TCDF	ND	---	1.0
Total TCDF	ND	---	1.0
2,3,7,8-TCDD	ND	---	1.0
Total TCDD	ND	---	1.0
1,2,3,7,8-PeCDF	ND	---	5.0
2,3,4,7,8-PeCDF	ND	---	5.0
Total PeCDF	ND	---	5.0
1,2,3,7,8-PeCDD	ND	---	5.0
Total PeCDD	ND	---	5.0
1,2,3,4,7,8-HxCDF	ND	---	5.0
1,2,3,6,7,8-HxCDF	ND	---	5.0
2,3,4,6,7,8-HxCDF	ND	---	5.0
1,2,3,7,8,9-HxCDF	ND	---	5.0
Total HxCDF	ND	---	5.0
1,2,3,4,7,8-HxCDD	ND	---	5.0
1,2,3,6,7,8-HxCDD	ND	---	5.0
1,2,3,7,8,9-HxCDD	ND	---	5.0
Total HxCDD	ND	---	5.0
1,2,3,4,6,7,8-HpCDF	ND	---	5.0
1,2,3,4,7,8,9-HpCDF	ND	---	5.0
Total HpCDF	ND	---	5.0
1,2,3,4,6,7,8-HpCDD	ND	---	5.0
Total HpCDD	ND	---	5.0
OCDF	ND	---	10
OCDD	ND	---	10

Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF-13C	2.00	74
2,3,7,8-TCDD-13C	2.00	63
1,2,3,7,8-PeCDF-13C	2.00	90
2,3,4,7,8-PeCDF-13C	2.00	91
1,2,3,7,8-PeCDD-13C	2.00	96
1,2,3,4,7,8-HxCDF-13C	2.00	74
1,2,3,6,7,8-HxCDF-13C	2.00	76
2,3,4,6,7,8-HxCDF-13C	2.00	78
1,2,3,7,8,9-HxCDF-13C	2.00	73
1,2,3,4,7,8-HxCDD-13C	2.00	75
1,2,3,6,7,8-HxCDD-13C	2.00	69
1,2,3,4,6,7,8-HpCDF-13C	2.00	63
1,2,3,4,7,8,9-HpCDF-13C	2.00	60
1,2,3,4,6,7,8-HpCDD-13C	2.00	66
OCDD-13C	4.00	57
1,2,3,4-TCDD-13C	2.00	NA
1,2,3,7,8,9-HxCDD-13C	2.00	NA
2,3,7,8-TCDD-37Cl4	0.20	62

Total 2,3,7,8-TCDD
Equivalence: 0.00 ng/Kg
(Lower-bound - Using 2005 WHO Factors)

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit

Results reported on a total weight basis and are valid to no more than 2 significant figures.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Pace Analytical™

Method 8290 Laboratory Control Spike Results

Lab Sample ID	LCS-90396		
Filename	U210603B_02	Matrix	Solid
Total Amount Extracted	10.7 g	Dilution	NA
ICAL ID	U210423	Extracted	05/28/2021 12:30
CCal Filename(s)	U210603B_01 & U210603B_18	Analyzed	06/03/2021 21:31
Method Blank ID	BLANK-90395	Injected By	SMT

Native Isomers	Qs (ng)	Qm (ng)	% Rec.
2,3,7,8-TCDF	0.20	0.22	109
Total TCDF			
2,3,7,8-TCDD	0.20	0.24	122
Total TCDD			
1,2,3,7,8-PeCDF	1.0	1.0	103
2,3,4,7,8-PeCDF	1.0	0.92	92
Total PeCDF			
1,2,3,7,8-PeCDD	1.0	0.97	97
Total PeCDD			
1,2,3,4,7,8-HxCDF	1.0	1.1	111
1,2,3,6,7,8-HxCDF	1.0	1.1	107
2,3,4,6,7,8-HxCDF	1.0	1.1	112
1,2,3,7,8,9-HxCDF	1.0	1.0	101
Total HxCDF			
1,2,3,4,7,8-HxCDD	1.0	1.1	109
1,2,3,6,7,8-HxCDD	1.0	1.2	120
1,2,3,7,8,9-HxCDD	1.0	1.0	105
Total HxCDD			
1,2,3,4,6,7,8-HpCDF	1.0	1.1	106
1,2,3,4,7,8,9-HpCDF	1.0	1.1	106
Total HpCDF			
1,2,3,4,6,7,8-HpCDD	1.0	1.1	107
Total HpCDD			
OCDF	2.0	2.2	111
OCDD	2.0	2.4	119

Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF-13C	2.0	64
2,3,7,8-TCDD-13C	2.0	63
1,2,3,7,8-PeCDF-13C	2.0	79
2,3,4,7,8-PeCDF-13C	2.0	85
1,2,3,7,8-PeCDD-13C	2.0	88
1,2,3,4,7,8-HxCDF-13C	2.0	66
1,2,3,6,7,8-HxCDF-13C	2.0	69
2,3,4,6,7,8-HxCDF-13C	2.0	69
1,2,3,7,8,9-HxCDF-13C	2.0	70
1,2,3,4,7,8-HxCDD-13C	2.0	70
1,2,3,6,7,8-HxCDD-13C	2.0	67
1,2,3,4,6,7,8-HpCDF-13C	2.0	62
1,2,3,4,7,8,9-HpCDF-13C	2.0	59
1,2,3,4,6,7,8-HpCDD-13C	2.0	66
OCDD-13C	4.0	57
1,2,3,4-TCDD-13C	2.0	NA
1,2,3,7,8,9-HxCDD-13C	2.0	NA
2,3,7,8-TCDD-37Cl4	0.20	60

Qs = Quantity Spiked
Qm = Quantity Measured
Rec. = Recovery (Expressed as Percent)
R = Recovery outside of target range

Y = RF averaging used in calculations
Nn = Value obtained from additional analysis
NA = Not Applicable
* = See Discussion

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 8290 Spiked Sample Report

Client - Covanta

Client's Sample ID	MBN Q2-2021 Ash Sample-MS		
Lab Sample ID	10562480001-MS		
Filename	U210603B_03	Matrix	Solid
Total Amount Extracted	10.2 g	Dilution	NA
ICAL ID	U210423	Extracted	05/28/2021 12:30
CCal Filename(s)	U210603B_01 & U210603B_18	Analyzed	06/03/2021 22:16
Method Blank ID	BLANK-90395	Injected By	SMT

Native Isomers	Qs (ng)	Qm (ng)	% Rec.	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.20	0.40	199 R	2,3,7,8-TCDF-13C	2.00	58
				2,3,7,8-TCDD-13C	2.00	35 R
				1,2,3,7,8-PeCDF-13C	2.00	76
2,3,7,8-TCDD	0.20	0.23	116	2,3,4,7,8-PeCDF-13C	2.00	80
				1,2,3,7,8-PeCDD-13C	2.00	81
				1,2,3,4,7,8-HxCDF-13C	2.00	67
1,2,3,7,8-PeCDF	1.00	1.35	135	1,2,3,6,7,8-HxCDF-13C	2.00	69
2,3,4,7,8-PeCDF	1.00	1.30	130	2,3,4,6,7,8-HxCDF-13C	2.00	68
				1,2,3,7,8,9-HxCDF-13C	2.00	67
				1,2,3,4,7,8-HxCDD-13C	2.00	68
1,2,3,7,8-PeCDD	1.00	1.11	111	1,2,3,6,7,8-HxCDD-13C	2.00	66
				1,2,3,4,6,7,8-HpCDF-13C	2.00	55
				1,2,3,4,7,8,9-HpCDF-13C	2.00	39 R
1,2,3,4,7,8-HxCDF	1.00	1.34	134	1,2,3,4,6,7,8-HpCDD-13C	2.00	58
1,2,3,6,7,8-HxCDF	1.00	1.37	137	OCDD-13C	4.00	47
2,3,4,6,7,8-HxCDF	1.00	1.27	127			
1,2,3,7,8,9-HxCDF	1.00	1.13	113	1,2,3,4-TCDD-13C	2.00	NA
				1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	1.00	1.15	115	2,3,7,8-TCDD-37Cl4	0.20	31
1,2,3,6,7,8-HxCDD	1.00	1.24	124			
1,2,3,7,8,9-HxCDD	1.00	1.11	111			
1,2,3,4,6,7,8-HpCDF	1.00	1.63	163 R			
1,2,3,4,7,8,9-HpCDF	1.00	1.17	117			
1,2,3,4,6,7,8-HpCDD	1.00	1.61	161 R			
OCDF	2.00	1.52	76 R			
OCDD	2.00	4.12	206 R			

Qs = Quantity Spiked Qm = Quantity Measured Rec. = Recovery (Expressed as Percent)

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
R = Recovery outside target range

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 8290 Spiked Sample Report

Client - Covanta

Client's Sample ID	MBN Q2-2021 Ash Sample-MSD		
Lab Sample ID	10562480001-MSD		
Filename	U210603B_04	Matrix	Solid
Total Amount Extracted	10.3 g	Dilution	NA
ICAL ID	U210423	Extracted	05/28/2021 12:30
CCal Filename(s)	U210603B_01 & U210603B_18	Analyzed	06/03/2021 23:00
Method Blank ID	BLANK-90395	Injected By	SMT

Native Isomers	Qs (ng)	Qm (ng)	% Rec.
2,3,7,8-TCDF	0.20	0.65	323
2,3,7,8-TCDD	0.20	0.20	102
1,2,3,7,8-PeCDF	1.00	1.70	170
2,3,4,7,8-PeCDF	1.00	1.48	148
1,2,3,7,8-PeCDD	1.00	1.24	124
1,2,3,4,7,8-HxCDF	1.00	1.71	171
1,2,3,6,7,8-HxCDF	1.00	1.55	155
2,3,4,6,7,8-HxCDF	1.00	1.48	148
1,2,3,7,8,9-HxCDF	1.00	1.22	122
1,2,3,4,7,8-HxCDD	1.00	1.23	123
1,2,3,6,7,8-HxCDD	1.00	1.33	133
1,2,3,7,8,9-HxCDD	1.00	1.18	118
1,2,3,4,6,7,8-HpCDF	1.00	2.32	232
1,2,3,4,7,8,9-HpCDF	1.00	1.22	122
1,2,3,4,6,7,8-HpCDD	1.00	2.12	212
OCDF	2.00	2.31	116
OCDD	2.00	5.49	275

Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF-13C	2.00	66
2,3,7,8-TCDD-13C	2.00	44
1,2,3,7,8-PeCDF-13C	2.00	84
2,3,4,7,8-PeCDF-13C	2.00	88
1,2,3,7,8-PeCDD-13C	2.00	93
1,2,3,4,7,8-HxCDF-13C	2.00	73
1,2,3,6,7,8-HxCDF-13C	2.00	78
2,3,4,6,7,8-HxCDF-13C	2.00	75
1,2,3,7,8,9-HxCDF-13C	2.00	73
1,2,3,4,7,8-HxCDD-13C	2.00	77
1,2,3,6,7,8-HxCDD-13C	2.00	74
1,2,3,4,6,7,8-HpCDF-13C	2.00	59
1,2,3,4,7,8,9-HpCDF-13C	2.00	38 R
1,2,3,4,6,7,8-HpCDD-13C	2.00	62
OCDD-13C	4.00	55
1,2,3,4-TCDD-13C	2.00	NA
1,2,3,7,8,9-HxCDD-13C	2.00	NA
2,3,7,8-TCDD-37Cl4	0.20	39

Qs = Quantity Spiked Qm = Quantity Measured Rec. = Recovery (Expressed as Percent)

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
R = Recovery outside target range

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 8290 Spike Sample Results

Client - Covanta

Client Sample ID	MBN Q2-2021 Ash Sample			Dry Weights	
Lab Sample ID	10562480001	Sample Filename	U210603B_16	Sample Amount	8.41 g
MS ID	10562480001-MS	MS Filename	U210603B_03	MS Amount	8.4 g
MSD ID	10562480001-MSD	MSD Filename	U210603B_04	MSD Amount	8.5 g

Analyte	Sample Qm (ng)	MS/MSD Qs (ng)	MS Qm (ng)	MSD Qm (ng)	RPD	Background Subtracted MS % Rec.	Background Subtracted MSD % Rec.	Background Subtracted RPD
2,3,7,8-TCDF	0.45	0.20	0.40	0.65	47.5	0	98	200.0
2,3,7,8-TCDD	0.00	0.20	0.23	0.20	12.3	116	102	12.3
1,2,3,7,8-PeCDF	0.66	1.00	1.35	1.70	22.9	70	105	40.2
2,3,4,7,8-PeCDF	0.51	1.00	1.30	1.48	13.4	79	98	21.0
1,2,3,7,8-PeCDD	0.21	1.00	1.11	1.24	10.9	90	103	13.3
1,2,3,4,7,8-HxCDF	0.52	1.00	1.34	1.71	23.7	82	118	36.1
1,2,3,6,7,8-HxCDF	0.55	1.00	1.37	1.55	12.1	82	100	19.3
2,3,4,6,7,8-HxCDF	0.38	1.00	1.27	1.48	15.1	89	109	20.9
1,2,3,7,8,9-HxCDF	0.11	1.00	1.13	1.22	7.5	103	111	8.2
1,2,3,4,7,8-HxCDD	0.10	1.00	1.15	1.23	6.2	105	113	6.7
1,2,3,6,7,8-HxCDD	0.16	1.00	1.24	1.33	7.3	107	117	8.3
1,2,3,7,8,9-HxCDD	0.13	1.00	1.11	1.18	5.9	98	105	6.7
1,2,3,4,6,7,8-HpCDF	1.15	1.00	1.63	2.32	34.6	48	116	83.2
1,2,3,4,7,8,9-HpCDF	0.13	1.00	1.17	1.22	4.2	104	109	4.7
1,2,3,4,6,7,8-HpCDD	1.01	1.00	1.61	2.12	26.9	60	110	58.9
OCDF	0.43	2.00	1.52	2.31	41.6	54	94	53.7
OCDD	3.35	2.00	4.12	5.49	28.6	39	107	94.2

Definitions

MS = Matrix Spike
MSD = Matrix Spike Duplicate
Qm = Quantity Measured
Qs = Quantity Spiked
% Rec. = Percent Recovery
RPD = Relative Percent Difference
NA = Not Applicable
NC = Not Calculated

CDD = Chlorinated dibenzo-p-dioxin
CDF = Chlorinated dibenzo-p-furan
T = Tetra
Pe = Penta
Hx = Hexa
Hp = Hepta
O = Octa